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American Veterinary Medical Association

FORMERLY

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(Original Official Organ U. S. Vet. Med. Assn.)

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The American Veterinary Medical Association

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H. Preston Hoskins, Secretary-Editor, 735 Book Building, Detroit, Mich.

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Vol. LXIII, N. S. Vol. 16 June, 1923 No. 3

IN ITS MAKING

In the April 1923 JOURNAL there appears an editorial headed "Publicity." Undoubtedly the author received his inspiration either from the absence of correct publicity or from the announcement that a commercial organization interested in the profession would launch an advertising campaign for the purpose of telling the truth. A most commendable editorial which speaks for the veterinary profession as a whole in broader terms than has ever before been approached.

The veterinary profession, professionally speaking, is young, and those who have liberally contributed toward its success are still in their prime and capable of accomplishing much more. The profession is now in its makng; the foundation has been laid, the corner-stone has been sealed, and the frame-work has been erected, but the final arrangements which will contribute to its usefulness are now under construction. The masses casually view the skeleton frame-work and hear nothing of what it will ultimately mean. It is for us, the designers and builders, intelligently to inform the world what we are trying to do. We must not expect sensational advertising to do it all, but depend upon it as suggestive of what we can do; then let our achievements tell the truth.

Every veterinarian becomes a unit in the campiagn about to be inaugurated and unless he measures up to the requirements, he alone will suffer, not the profession. It is either one or two things; help ourselves a little bit more, in conjunction with the advertising, or retrograde and deprive the profession a unit of assistance. The public is not holding the veterinarian from progression; conversely, it is offering immeasurable encouragement.

Certain members within the ranks are the enemies of the profession. The veterinarian who maintains headquarters around a filthy livery stable, or displays his sign over an old barn or shed with interior equipment to correspond, is an enemy to progression, sanitation and decency. This same veterinarian may have a slovenly appearance and be exceedingly adept in the use of vulgar and vile language. Yet all the advertising in the world, of what has been accomplished and what we hope to do, will never raise the foregoing class from the quagmire of disrespect and disgrace. Nevertheless, we have these factors to contend with and it is our duty to enter the missionary field and reduce the careless to an insignificant minority.

Every meeting of the A. V. M. A. should strive toward being an educational factor. The press is then at their service without cost, but see to it that accurate information is published consistent with the dignity of our ambitions.

E. I. S.

SPECIAL TRAIN FOR MONTREAL

Arrangements are being made for a special train, in connection with our convention, in Montreal, August 27-31. Dr. L. A. Merillat, Editor of *Veterinary Medicine,* is the originator of this idea. We are lending every possible assistance, at this end of the line, to popularize this mode of travel to the Convention City. The plans for the special train are as yet incomplete, but it is quite likely that the train will leave Chicago over the Wabash Railway, at about 8:30 a. m., Saturday morning, August 25th. The train will reach Detroit during the afternoon and depart over the Canadian Pacific Railway, at about 4:30 p. m., for Kingston, arriving early Sunday morning. The party will leave the train at Kingston and travel by boat down the St. Lawrence to Montreal, arriving in the Convention City Sunday evening. This will enable them to spend Sunday night resting up, so as to be fresh to participate in the program beginning Monday morning.

We have been promised the certificate plan in connection with the railroad fares. This provides that if 250 travel by rail to the convention, and secure the proper certificates when the tickets *going* are purchased, these will entitle the holders to a one-half fare *returning*. We should have no difficulty in securing the requisite number of certificates, although it would be well for our members to keep in mind the difficulties which were encountered in this connection at St. Louis last year, through failure of so many members to secure their certificates when they purchased their tickets. Just as soon as plans for the special train are completed, announcement will be made in these pages. It is hoped that we will be able to make such announcement in the July issue.

EXECUTIVE BOARD ELECTIONS

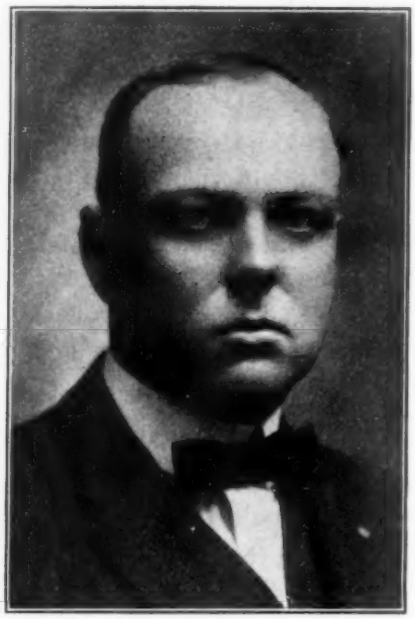
This is being written more than three weeks after the ballots were mailed for the election of members of the Executive Board for Districts 2 and 3. We cannot refrain from commenting upon the apparent lack of interest in this important part of our Association's activities. In District No. 2, over one-third of the members eligible to cast a ballot have failed to do so, while in District No. 3 more than one-half of the members eligible have failed to indicate their choice.

We have referred to the manner of electing our Executive Board as being the most democratic feature of the Association, but observations made on elections recently held in three out of the six districts lead us to doubt seriously whether mail-ballotting is entirely a success. We feel obliged to refer to this matter again, at this particular time, in view of the fact that there are members of the Association who are of the opinion that this feature of selecting officers by mail ballot should be extended, to include other officers. It is frequently stated that, in all large organizations, political or otherwise, it is frequently the organized minority which rules, and not the majority.

So far as the present elections are concerned, there can be no criticisms that the eleven candidates are not well known. Every one is a prominent veterinarian, both locally and nationally. There is sufficient range of choice to satisfy almost anybody, so far as the personal qualifications of the candidates are concerned. Among the eleven are seven practitioners, one state control official, one veterinary college professor, one laboratory man, and an editor; and yet almost six hundred members have, for some reason, failed to make a selection. What is the reason for this?

AN OUTSTANDING VETERINARIAN

Dr. W. A. Haines, of Bristol, Pa., who graduated from the Veterinary School of the University of Pennsylvania, in 1907, is now serving his third term as Bucks County Representative in the Pennsylvania Legislature, a distinction which has never before been bestowed in his County. He is chairman of the Agricultural Committee, a very important and responsible committee of the House of Representatives, and is a member of the following Committees: Appropriations, Public Health and Sanitation, Manufactures, and Game.



DR. W. A. HAINES

Immediately after he graduated, Dr. Haines began the practice of veterinary medicine in the Bristol community. Not only did he become successful in veterinary medicine but his success has carried him into many other fields. He operates one large dairy farm, is a vegetable and fruit grower and is interested in a large sand quarry.

Dr. Haines' opinion has considerable weight in most all problems pertaining to veterinary science and is well worth considering on most all matters relating to agriculture, live stock and educational questions in general. He was influential in the

organization of the Bucks County Farm Bureau and several other local organizations. He is president of the Veterinary Alumni Society of the University of Pennsylvania, is frequently asked to serve on committees of variable interests and is also a bank director.

Let more of us follow Dr. Haines' example.

DEALER HELPS

No business man discounts the value of appearing to give something for nothing. It is frequently stated that we do not get anything for nothing, in this world, and that we pay for everything we get in one way or another. This is probably true. The term "dealer helps" is one which is frequently heard in commercial circles. Manufacturers of a great variety of articles assist their retail dealers in selling their products through the agency of these so-called "dealer helps." It is not strange that this modern method of merchandizing should have found its way into the veterinary field; it is in keeping with the times.

One prominent manufacturer of veterinary biological and pharmaceutical products is supplying veterinarians with cards, which they may circulate among their clients, offering to make post mortems on dead chickens, if the same are brought to the veterinarian's office or hospital. We are informed that the concern in question has received requests from veterinarians for over thirty thousand such cards. These briefly mention the common diseases of poultry and indicate that the veterinarian is prepared to vaccinate against or treat these conditions.

We are also informed that one state institution is doing something of the same kind, having also extended the idea to infectious abortion in swine. The swine breeder receives a card calling his attention to a few features of this disease and on the reverse side is a paragraph stating that the presentation of the card to his local veterinarian would entitle him to free office consultation and advice on abortion disease in swine. We believe that although this does savor of appearing to give something for nothing, that all parties concerned will profit in the end. We would like to hear what have been the actual results obtained by veterinarians who have taken advantage of this means of extending their practices.

YOU WILL BE DRAFTED

If you are of military age and physically fit, you are liable for military duty in case of national emergency. If you are not commissioned in the Officers Reserve Corps before November 11, 1923 (Armistice Day), you will be subject to draft for service in any capacity that the authorities think you are fitted for.

In case of national emergency, ALL officers not already on the active list, will be drawn from the Officers Reserve Corps. Officers will not be commissioned from civil life after the 11th of next November.

Veterinarians commissioned in the Officers Reserve Corps are assigned to definite units, so that in case of war they will know exactly where they are to go and what they are to do, thus avoiding the unfortunate confusion that occurred when we entered the World War. Veterinarians of training and ability are needed in the Veterinary Officers Reserve Corps. It is your duty as a patriotic citizen and as a veterinarian to place your services at the disposal of your country in time of war. Send to Col. J. A. McKinnon, Director of the Veterinary Corps, Surgeon General's Office, Washington, D. C., for full information and application blanks. If you do not do this before November 11th, and you are drafted as a private, the fault is yours.—*Do your duty and do it now.*

N. S. M.

NEW ENGLAND TUBERCULOSIS CONFERENCE

The fourth annual Bovine Tuberculosis Eradication Conference will be held in the State House, Concord, N. H., June 12-13, 1923. Two full days will be devoted to addresses, discussions and reports pertaining to the control and eradication of tuberculosis from cattle and its bearing on human health.

Speakers of national prominence, who will address the conference include: Dr. John R. Mohler, Chief of the Bureau of Animal Industry, and Dr. J. A. Kiernan, in charge of the Bovine Tuberculosis Eradication Division, Washington, D. C.; Professor H. R. Smith, Live Stock Commissioner, Chicago, Illinois; Hon. C. P. Norgord, Commissioner of Agriculture, Wisconsin; Hon. Andrew L. Felker, Commissioner of Agriculture, New Hampshire; Dr. F. Torrance, Veterinary Director General, Ottawa, Canada; Dr. E. C. Schroeder, Pathologist and Bac-

teriologist, Federal Experiment Station, Bethesda, Maryland; Dr. Wm. M. Stockwell, Superintendent of State Tuberculosis Sanitarium, Hartford, Conn.; Dr. Donnelly, President of the American Association of Certified Milk Commissioners, Brooklyn, New York; and many other eminent men.

EXAMINATIONS FOR ACCREDITED VETERINARIANS

Arrangements are being made to hold another examination, on June 25, 1923, for veterinarians who are not already on the accredited list and who are desirous of becoming accredited to do tuberculin testing. This examination will be held in several of the States and any veterinarian who is interested in taking it can learn all particulars as to the time and place of the examination in his State by addressing the State Veterinarian or the proper Live Stock Sanitary official of his State.

COMING VETERINARY MEETINGS

New York City, Veterinary Medical Association of. Academy of Medicine, 17 W. 43rd St., New York, N. Y. June 6, 1923. Dr. C. G. Rohrer, Secretary, 40 W. 61st St., New York, N. Y.

Arkansas Veterinary Association. Marion Hotel, Little Rock, Ark. June 9, 1923. Dr. J. H. Bux, Secretary, Little Rock, Ark.

Texas, State Veterinary Medical Association of. Dallas, Texas. June 20-21, 1923. Dr. W. R. McCuistion, Secretary, 701 Wheat Bldg., Fort Worth, Texas.

California State Veterinary Medical Association, San Francisco, Cal. June 21-22-23, 1923. Dr. J. P. Bushong, Secretary, 908 Lindsay St., Los Angeles, Cal.

Michigan State Veterinary Medical Association. East Lansing, Mich. June 26-27-28, 1923. Dr. R. A. Runnells, Secretary. East Lansing, Mich.

Massachusetts Veterinary Association. Young's Hotel, Boston, Mass. June 27, 1923. Dr. C. H. Playdon, Secretary, Reading, Mass.

North Carolina State Veterinary Medical Association. Statesville, N. C. June 27-28, 1923. Dr. J. P. Spoon, Secretary, Burlington, N. C.

Oklahoma State Veterinary Medical Association. Medicine Park, Okla. July 9-10, 1923. Dr. L. B. Barber, Secretary, Live Stock Exchange Bldg., Oklahoma City, Okla.

Illinois State Veterinary Medical Association and Fourth Annual Veterinary Conference. Urbana, Ill. July 10-11-12, 1923. Dr. L. A. Merrilat, Secretary, 4753 Grand Boulevard, Chicago, Ill.

New Jersey, Veterinary Medical Association of. Hotel Marlborough, Asbury Park, N. J. July 12-13, 1923. Dr. P. B. Silvester, Secretary, Princeton, N. J.

Virginia State Veterinary Medical Association. Ocean View, Va. July 12-13, 1923. Dr. Geo. C. Faville, Secretary, Hampton, Va.

Minnesota State Veterinary Medical Association. University Farm, St. Paul, Minn. July 18-19, 1923. Dr. C. P. Fitch, Secretary, University Farm, St. Paul, Minn.

Missouri Valley Veterinary Association. Omaha, Nebr. July 23-24-25, 1923. Dr. E. R. Steel, Secretary, Grundy Center, Iowa.

Kentucky Veterinary Medical Association. Lebanon, Ky. July 25-26, 1923. Dr. J. A. Winkler, Secretary, Newport, Ky.

New York State Veterinary Medical Society. Ithaca, N. Y. July 25-26-27, 1923. Dr. C. E. Hayden, Secretary, Ithaca, N. Y.

STATE BOARD EXAMINATIONS

Arkansas State Board of Veterinary Examiners. Little Rock, Ark. June 6, 1923.

Colorado State Board of Examiners. Capitol Bldg., Denver, Colo. June 8-9, 1923. Dr. A. N. Carroll, Secretary, Pueblo, Colo.

Texas State Board of Veterinary Examiners. Dallas, Texas. June 18-19, 1923.

California State Board of Examiners. San Francisco, Cal. June 20, 1923. Dr. John L. Tyler, Secretary, 120 E. Belgrave Ave., Huntington Park, Cal.

Illinois State Board of Examiners. Senate Room, Capitol, Springfield, Ill. June 25-26, 1923.

Massachusetts State Board of Examiners. State House, Boston, Mass. June 26-27, 1923. Dr. E. W. Babson, Secretary, Gloucester, Mass.

New Jersey, State Board of Veterinary Medical Examiners of. State House, Trenton, N. J. June 29-30, 1923. Dr. J. Payne Lowe, President, 171 Jefferson St., Passaic, N. J.

THE MALE AS A SPREADER OF GENITAL INFECTIONS[1]

By W. L. WILLIAMS, *Ithaca, N. Y.*

Mammalian existence is divisible into two distinct periods—pre- and post-natal. In each the health and life of the individual is constantly menaced by infection.

The study of disease has been almost wholly devoted to post-natal infections, of which vast numbers are recognized, and most of them are more or less effectively controlled. For all practical purposes, most veterinarians and breeders think of but one pre-natal infection for each species, which is termed *abortion* and its presence is indicated by the observed expulsion of a fetal cadaver. It has been undeniably shown, in recent years, that abortion accounts for but a minor portion of the losses from infections interfering with reproduction. The other infections of pre-natal life are commonly attributed to "sequelae" or "complications" of *contagious abortion*, although so far as known, the bacillus generally considered as the specific cause of abortion may not have been present at any time. By this expedient public attention is kept riveted upon *contagious abortion*, due to one specific bacillus, as the sole important cause of interferences with reproduction.

In human medicine two main venereal infections are recognized. Syphilis is regarded as a very important, the most important cause of any one infection, of abortion. Gonorrhea probably lowers the birth-rate as greatly as syphilis, but it acts with greater celerity and kills the ovum before or shortly after fertilization.

It is commonly stated by writers upon dourine that it causes abortion in mares, but writers upon equine abortion say that *the* cause is a bacterium, thus excluding the trypanosome. Whether dourine actually causes abortion in important numbers is unknown. In one of the largest outbreaks, the first in America, that in DeWitt County, Illinois, in 1886, which came under my official charge, no case of abortion could be definitely traced to it. Dourine acts too quickly and powerfully and destroys the ovum prior to the abortion period. There has been a mortal infection of the ovum but no fetal cadaver is seen expelled.

Aside from dourine, recognized venereal infections are not

[1]Presented at the fifteenth annual Conference for Veterinarians at Cornell University, January 12, 1923.

commonly blamed with causing serious pre-natal disease. The genital pox or exanthem of equidae and bovidae are not commonly regarded as causing pre-natal infection, in the sense that they interfere with reproduction, but are thought merely to produce a brief disease of the copulatory organs. I am not aware that any data exist showing that females do, or do not conceive successfully by the same coitus which transmits the disease.

There is a general assumption by most people that the genital tracts, especially the deeper and more essential parts, are free from infection, although plenty of data are on record showing that the reverse is true. The thought that the uterus and other organs *should* be bacteria-free is apparently so irresistible that the ideal is accepted as proof and all evidence to the contrary ignored.

The study of pre-natal pathology was long deferred because there was upon the whole a surplus of young and it was necessary to limit reproduction by castration or sexual isolation. There was not, in earlier times, so marked a recognition of the difference in value between an excellent and a poor individual. This recognition of difference in values has become great. Now it is desired to breed only superior animals and in order to maintain adequate numbers it is essential that these produce the maximum of healthy young. Under these conditions pre-natal pathology has become of acute importance.

According to available data, it requires ten copulations for each four healthy young born in horses and cattle, with analogous results in swine. The failure of sixty per cent of the copulations to produce living young is referable to pre-natal death resulting from infection. If the infection kills or mortally injures the spermatozoa in the *tubuli seminiferi*, or elsewhere in the male genitalia, if the infection is added to the semen ejaculated and later kills the spermatozoa or the fertilized ovum, or if the infection exists in the ovary, oviduct or uterus of the female and kills ovum or spermatozoa, the principle remains the same; it is death from genital infection. So in cows, available data show pre-natal death of sixty per cent of all ova it is attempted to fertilize. If the same rate of mortality continued after birth, all calves would die before six months old. Viewed from this standpoint, the importance of pre-natal infection looms large.

The rate of mortality decreases as the age of the newly created individual increases. The most vulnerable separate mammalian life is the individual spermatozoon or ovum, while the newly

fertilized ovum apparently has but little greater resistance to bacteria. These early deaths do not interfere with the normal ovulation cycle.

The embryo early forms a buffer organ which is designated the placenta or afterbirth. This completely envelopes the young and affords wonderful protection but it is always imperfect. In all ruminants and swine there uniformly occur necrotic areas at the apices of the fetal membranes, due certainly to infection. In the equine fetus analogous conditions regularly occur in the chorion of the non-gravid horn. These pathologic changes in the fetal membranes advance as pregnancy progresses. If the fetus survives and is born, it discards the more or less extensively diseased organ and leaves it behind.

We marvel at times at the efficiency with which the living body casts off necrotic tissues. Here is a great organ, which has served a highly valuable function, over an important period of time, during which it has been attacked and become extensively diseased. Within this envelop and under its protection, new organs have been developed to take over its functions, and at an opportune moment the old diseased one is discarded, to be succeeded by the others which have been more substantially evolved. The new-born animal therefore begins post-natal life with as great freedom from infection as the placenta has been able to maintain. Thus a placenta may be so badly infected that it is "retained," although it may have protected the fetus well enough that it may be born slightly if at all infected and is vigorous and viable. Not always, however, is the placenta able to give ample protection to the fetus which survives to the normal end of pregnancy and is born. Often it is born so extensively infected that it falls seriously or mortally ill. If it survives it may carry the infection for an indefinite period in its post-natal life, thus constituting a link of continuity between pre- and post-natal infection. Recent investigations have shown that the essential genital organs of the male (testicles, epididymes, seminal vesicles, etc.) and of the female (ovaries, oviducts, uterus and cervix) quite commonly harbor infections which may at any time develop important pathogenic powers.

All genital infections producing definitely recognizable, specific lesions are freely interchangeable between the two sexes in coitus, such as dourine, the vesicular venereal disease, the venereal tumors of dogs, etc.

During pre-natal life the individual is menaced by infections from three sources. (1) The female genital tract regularly contains infections prior to copulation which may threaten the health or life of the new individual or of the male and female cells prior to union. (2) The male may ejaculate dangerous bacteria in his semen. (3) Infection may invade the pregnant uterus from the systemic blood of the female and thus reach the pre-natal individual.

Loyal disciples of the tradition that abortion is essentially, if not wholly, a result of bacterial invasion of the third class, firmly and intolerantly deny the importance of classes (1) and (2). Limiting their observations and theorizing entirely to the abortion bacillus, they have totally ignored class (1) upon the bacteriologic ground that at mating time they do not find this bacillus in the female genitalia. The literature does not indicate that the researches upon this point have been either extensive or accurate. At best the researches apply only to the abortion bacillus and leave untouched the far more comprehensive problem of pre-natal infection.

In the second group, which it is desired to discuss at this time, misleading effort was made by the adherents to the contagious abortion tradition with a view to cause veterinary practitioners and breeders to believe that the bull is not a source of danger and may be ignored as a carrier of genital infections. McFadyean and Stockman[1], Hadley[2] and others, used bulls which had copulated with cows which had sometime aborted, or the blood of which had reacted to the test for abortion infection, upon cows which were presumably healthy. The cows largely conceived and did not abort. It was not known that any one of the bulls discharged abortion bacilli in his semen or that he carried abortion bacilli mechanically upon his copulatory organs. Without using a bull which was known to be capable of discharging abortion bacilli from his genital tract, they reached very positive conclusions that the bull does not transmit infection by copulation. Even so, their experiments were limited to the abortion bacillus and had little if anything to do with the subject under discussion.

Certain factors may profoundly alter the comparative dangers of the transmission of genital infections by sexual contact. Prostitution leads to grossly excessive and promiscuous coitus which results in very intense genital infection, quite uniformly transmitted to man. In animal husbandry this condition is

essentially reversed and the male is subjected to excessive and often promiscuous coitus, so that he has an opportunity to acquire various infections and faces the inevitable danger that the existing infections shall become intensified.

It has been thoroughly demonstrated, especially by the medical department of the Army and Navy, that coital infection of the male may be obviated by post-coital disinfection. There is, however, no such safeguard available to the female through the medium of attention to the copulatory organs.

It is important to bear in mind that the male ejaculates the bacteria-contaminated semen directly into the female genital canal. In the mare the semen is partly ejaculated into the uterine cavity and this is possibly true to a lesser degree in other species. This difference has led to great confusion. Douching of the copulatory organs has been roundly condemned by many for its failure to control pre-natal infections. It should be clearly recognized that douching of the copulatory organs is of service in the control of infections which at the time are restricted to the copulatory area and just as clearly understood that douching can exert no influence whatever upon infections existing in the deeply-seated, essential, procreative glands and canals.

The question of the power of the male to transmit genital infections in copulation is fundamentally a problem for clinical determination. Hadley[2] ignores this truth and classes clinical observations as "circumstantial evidence," forgetting that the question of the transmissability of diseases in general is necessarily decided upon clinical, not upon bacteriological or experimental evidence. Once the fact of contagiousness has been determined clinically, bacteriologic and experimental studies may be of very great value in clarifying diagnosis and methods of control. It has become an entirely too common and erroneous belief that a veterinary practitioner cannot determine by clinical observation that a disease is contagious and that this important question must be referred for decision to a bacteriologist.

W. W. Williams[3], in cooperation with the writer, secured data upon the breeding efficiency of eleven bulls with over 150 cows which were bred to them. The herd was, as a whole, saturated with genital infections when the first complete examination of the females was made in January, 1917. At that time no attention was being paid to the genital infections of the bulls. As shown in Chart I, the first inventory of the herd revealed the fact that 51.5% of the females of breeding age were pregnant or

CHART I

REPRODUCTIVE EFFICIENCY AS INDICATED BY YEARLY INVENTORIES OF BREEDING FEMALES

Date	Total Females	Pregnant or Pregnancy Terminated Within 3½ Months		Non-Pregnant Over 3½ Months	
2- 7-1917	103	53	51.5%	50	48.5%
9- 1-1918	84	53	63.0%	31	38.0%
10- 1-1919	66	45	68.2%	21	31.8%
10- 1-1920	75	57	76.0%	18	24.0%
7-15-1921	68	67	98.5%	1	1.5%

had been pregnant within 3½ months. Breeding operations were carried on with approximately equal energy throughout the year and there should have been at least as many females pregnant or recently calved on January 7, as upon any other day in the year. The cows being regularly placed upon official,

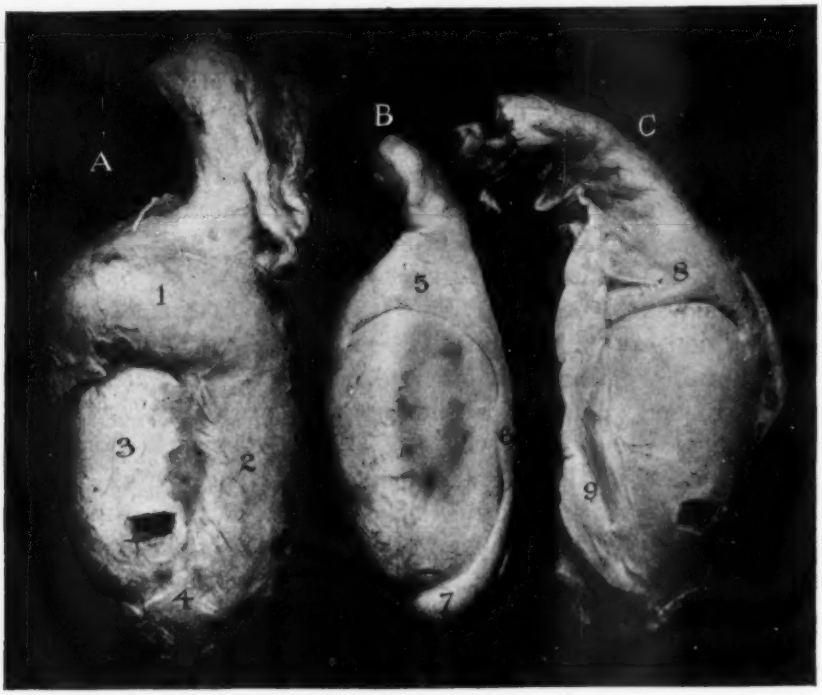


Figure 1. Diseased testicles and epididymes of bull P with a healthy left testicle (middle) for comparison.
A, diseased left testis; B, healthy left testis; C, diseased right testis.
1, globus major of left epididymis greatly enlarged and adherent to testis; 2, body of epididymis greatly enlarged; 3, testis; 4, tail of epididymis; 5, 6, 7, normal globus major, body and globus minor of epididymis respectively; 8, inflamed globus major of right testicle; 9, 9, adherent parietal scrotal peritoneum incised and turned back.
In A the parietal peritoneum has been removed by dissection.

yearly test they could not calve once each 365 days. Instead, the standard of computation adopted for this herd is 1 calf each 390 days. Upon this basis of computation there should have been ideally 73.1% pregnant or calved within 3½ months, instead of 51.5%, or 21.6% below the standard set. But among these 53 pregnancies 20 (37.7%) aborted, so that only 33 calved within the period of 390 days. Instead of the ideal of 100 healthy calves there were 33. The records of examinations of the genital organs of females in 1917 and 1918 show that in 29 they were apparently healthy, while each of the others showed at one time

Figure 2. Vesiculae seminales of bull P with normal vesicles on the left for comparison. Photographed from above and showing the anterior segment of pelvic urethra, seminal vesicles, ampullae of vasa deferentia, and urinary bladder.

1, 1, 1, 1, greatly enlarged, suppurating seminal vesicles (purulent spermato-vesiculitis) extending from the body of the prostate gland to the anterior end of the empty urinary bladder, 3.

In the healthy specimen on the left the normal seminal vesicles appear as two nodular swellings between the body of the prostate, 5, and the neck of the urinary bladder.

2, 2, enlarged terminal portions of the vasa deferentia; 3, urinary bladder; 4, pelvic urethra covered by Wilson's muscle and prostate gland; 5, body of prostate.

or another serious or incurable disease. The genital diseases gradually spread, and combined with tuberculosis had, within four years, caused the slaughter of all but two of the original females.

By handling the females alone some progress in reproductive efficiency was attained, but it was slow and the work was difficult and discouraging. After two years the improvement had been brought almost to a standstill. A number of very promising heifers which had been carefully grown were then ready to breed, and as an outcross the proprietor purchased by mail and imported a high priced sire. After he had served a number of heifers without a pregnancy, an examination revealed the fact that his testicles, epididymes and seminal vesicles were hopelessly infected and gross changes had occurred in these as shown in Figures 1 and 2. In his matings he ejaculated no semen because the glands contributing this fluid were all completely functionless. Infection in great abundance and of high virulence existed in his glands but thanks to the severity of the disease the infection was not ejaculated into the genital organs of the heifers and they were left unharmed.

This episode concentrated attention upon the other breeding bulls of the herd and resulted in the commencement of a highly interesting and instructive study of genital infections of bulls and of other breeding males.

Of the 6 bulls appearing in Chart II, A died and no postmortem was made, C was sold for breeding prior to the beginning of these studies, and bulls B, F, G and H were one after another slaughtered, as genital disease in each became manifest and careful examinations of the genital organs made. Bacterial growths were obtained from the genital glands of each and in three (the

CHART II

BREEDING RECORD OF SIX PRINCIPAL SIRES

Bull	A	B	C	F	G	H
Years used	1916-17	1916-18	1916-17	1918-19	1918-20	1917-19
Number of Cows Served	37	27	41	12	24	104
Average Copulations per Cow	1.67	1.56	1.24	2.0	1.5	1.8
Average Copulations per Conception	2.82	2.15	2.04	3.85	2.8	1.58
First Services	25	19	34	1	5	83
Previously Served by Other Bulls	12	8	7	11	19	21
Conceptions	59.5%	74.0%	61.0%	50.0%	54.1%	63.4%
Abortions	22.7%	33.3%	16.0%	66.7%	23.1%	25.8%

fourth was not examined microscopically), histologic changes of definite importance were found.

The bacterial study in no case revealed the presence of the Bang bacillus and in no case failed to yield cultures of a streptococcus, of the viridans group, with frequent association of other organisms.

CHART III

BREEDING RECORD OF OLD BULL AND 5 YOUNG BULLS

Bull	G[1]	Q	R	S	T	U	Total 5 Young Bulls
Year	1920	1920-21	1920	1920-21	1920-21	1921	1920-21
Total Cows Served	21	27	9	20	12	3	71
Services per Cow	1.62	1.22	1	1.35	1	1	1.19
Services per Conception	1.62	1.32	1.25	1.42	1.2	1.	1.35
First Service by This Bull	21	26	9	19	12	3	69
Served First by Another Bull	0	1	0	1	0	0	2
Conceptions	100%	93.6%	89%	80%	83.3%	100%	87.3%
Abortions	4.8%	0%	12.5%	6.25%	0%	0%	3.25%

[1]Old bull used in herd also 1918-1919.

A study of Charts II and III shows that the breeding efficiency varied greatly among the bulls and that given the number of copulations per conception, the ratio of abortion may be foretold with relative accuracy.

Bulls B and F were condemned and slaughtered early upon their breeding records alone. Before bulls G and H were slaughtered the technic of clinical examination had been developed sufficiently that clinical diagnoses of genital disease were definite. At the same time a technical study of spermatozoa had been developed, so that the diagnosis of genital disease of bulls was based upon, in the living animal: (1) his breeding record, (2) physical examination of his genital organs, (3) examination of his semen, (a) volume and appearance, (b) numbers and motility of spermatozoa, (c) *detailed studies of stained spermatozoa;* and (post mortem) (4) bacterial cultures from the various genital organs, (5) histologic sections of the tissues. While a positive diagnosis might be safe when based upon one or two of these 5 data it is preferable, as in other diagnoses, to substantiate it by all available evidence.

Taking Bull H as typical of the group:

1. His rate of conceptions (63.4%) was low, and the ratio of abortions (25.8%) was high. The abortions all occurred in

cows, the genital organs of which had been carefully examined before breeding and appeared healthy. No one of the aborters had been previously bred to another bull during that breeding season. The cows bred to him during the later part of his career quite uniformly showed virulent vaginitis within a few weeks after copulation. Later examinations commonly revealed severe cervicitis.

2. Spermato-cystitis was later recognizable upon clinical examination.
3. Examination of the semen at first showed an abundance of motile spermatozoa. As the infection progressed, later examinations showed fewer spermatozoa with less motility and increasing aberrations in the cells, until finally the cells were few, motionless, and commonly the spermatozoon heads were without body or tail—dead spermatozoa—as shown in Figure 4, in comparison with healthy spermatozoa as shown in Figure 3.
4. Bacterial cultures from the seminal vesicles yielded *Streptococcus viridans* and *hemolyticus*.
5. Histologic sections of his genital organs showed:
   (a) Desquamation of the germinal epithelium of the seminiferous tubules of his testicles, as shown in Figure 6, in comparison with a section of the healthy gland, as shown in Figure 5.
   (b) The epididymal tubules, as shown in Figure 8, revealed no spermatozoa, as in the healthy tubule in Figure 7, and the epididymal mucosa in bull H has been wholly destroyed, while in the healthy animal it remains intact.
   (c) The *vas deferens* of bull H shows complete desquamation of epithelium as shown in Figure 10, in contrast with the healthy duct in Figure 9.
   (d) The seminal vesicles have largely lost their epithelium by desquamation and their cavities are filled with exudate and debris, as shown in Figure 12, in contrast with a normal vesicle shown in Figure 11.

There is thus forged an accurate chain of evidence in which no link is missing or contains an obvious flaw. His record as a breeder, the clinical examination of his genital organs, the study of his semen and post-mortem bacterial searches and microscopic sections of his organs uniformly testify to the presence of disease, and indicate clearly the impossibility of the escape of spermatozoa from the testicles without the danger of carrying

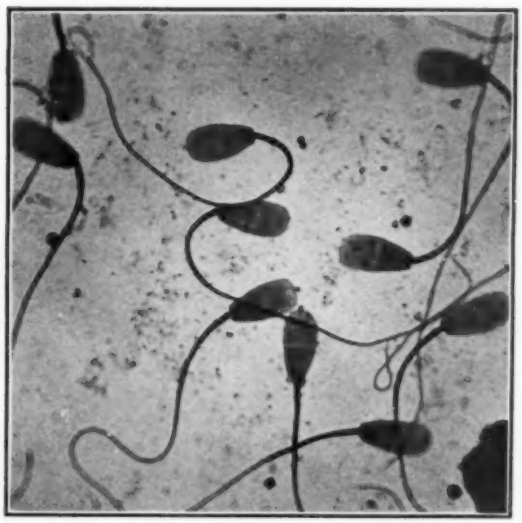


Figure 3. Healthy spermatozoa.

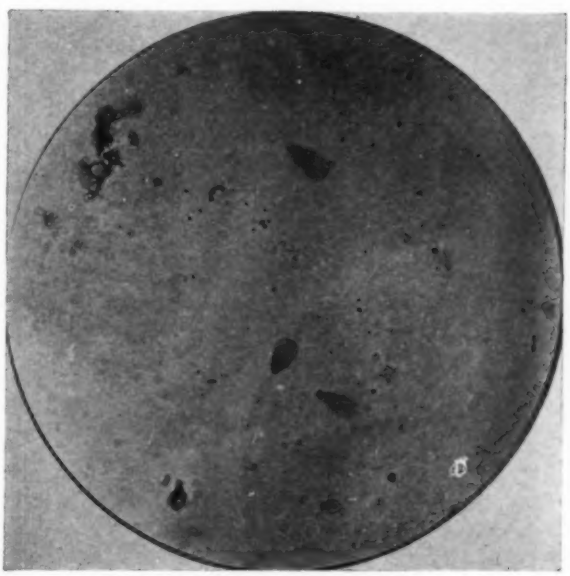


Figure 4. Abnormal spermatozoa collected from the vagina of cow after service with bull H.

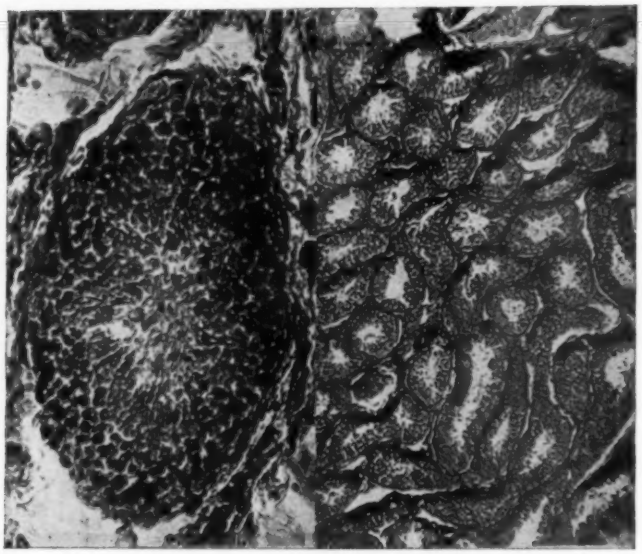


Figure 5. Normal seminiferous tubules under low (on the left), and high power (on the right).

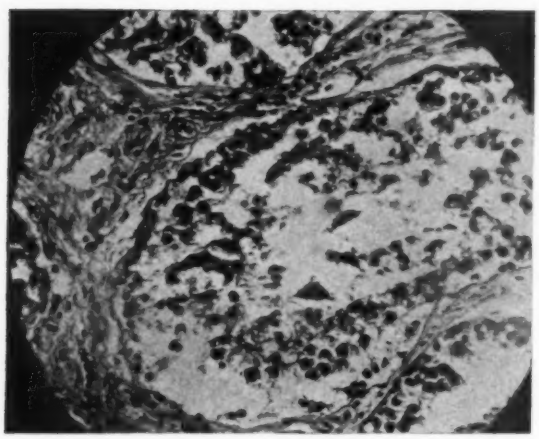


Figure 6. Seminiferous tubules from bull H showing desquamation of the germinal epithelium.

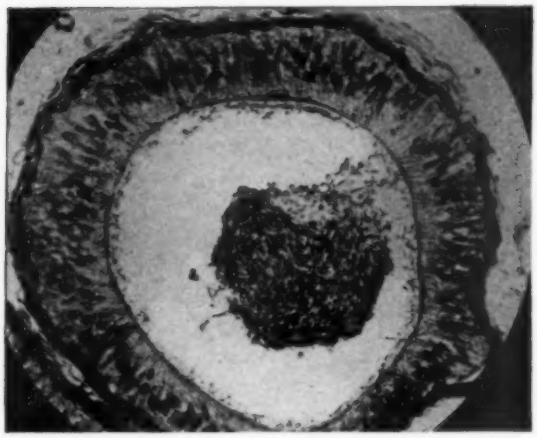


Figure 7. Normal epididymal tubule with ciliated columnar epithelium, its lumen filled with spermatozoa.

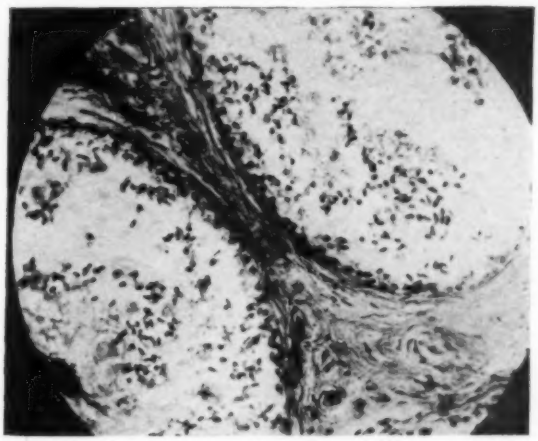


Figure 8. Epididymal tubules from bull H showing desquamation of the epithelium.

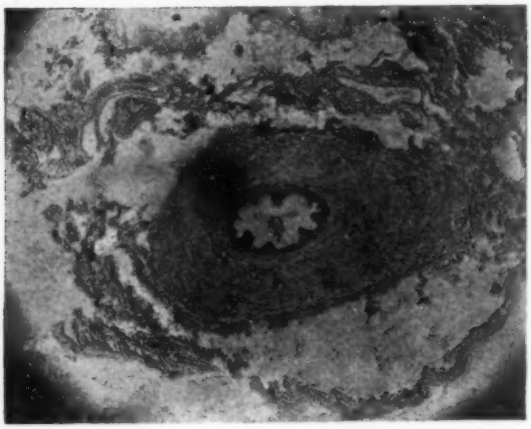


Figure 9. Cross section of normal vas deferens.

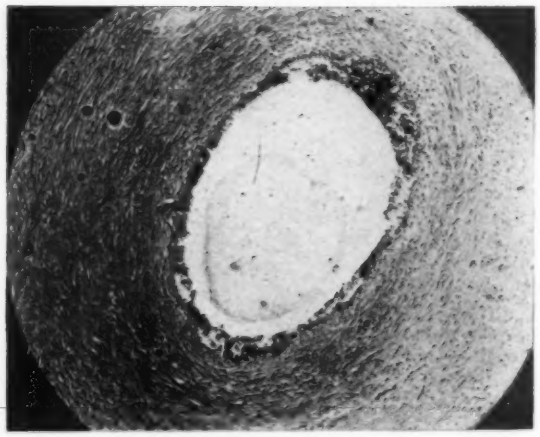


Figure 10. Cross section of vas deferens from bull H showing desquamation of its epithelium.

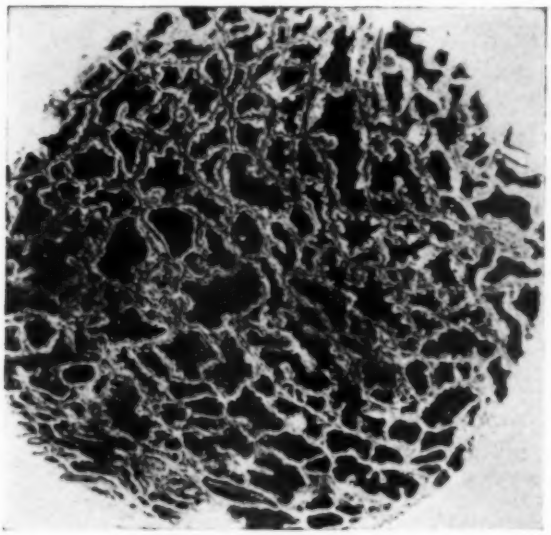


Figure 11. Section of normal seminal vesicle.

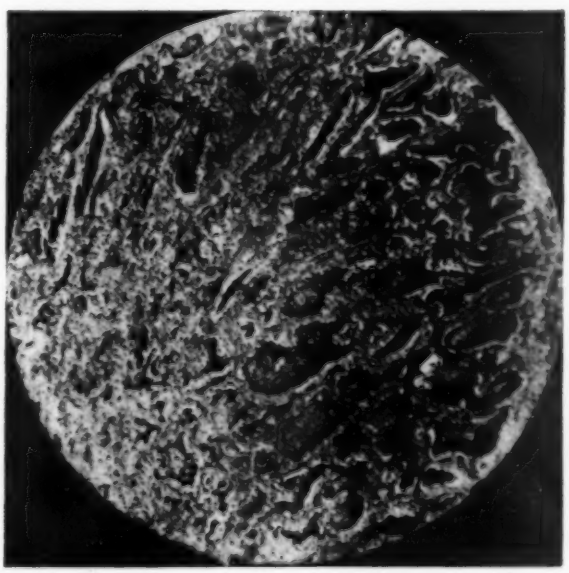


Figure 12. Section from diseased vesicle showing the lumen clogged with epithelial debris.

along bacteria, or of the fluid from the seminal vesicles being added to the semen at the moment of ejeculation without also adding bacteria. This proves irrefutably that bull H inevitably ejaculated bacteria in his semen. Logically an infection capable of causing such havoc in the genital organs of bull H should have a profound peril for the corresponding organs of the females into which the infection was thrown.

The females of this herd suffered in unusual proportions and intensity from cervicitis and salpingitis. The cervicitis largely yielded to treatment, but the salpingitis was beyond remedy and a large percentage of the original herd of females was ultimately destroyed on that account. Microscopic sections of the oviducts, as shown in Figure 14, indicated diseased changes analogous to those in Figure 7 from bull H, in sharp contrast to Figure 13, in which the normal oviduct is shown. Bacterial studies of the diseased oviducts yielded the same bacteria as those found in the genitalia of bull H.

It is impossible to understand how any reasonable person can doubt that bull H (and the other identically diseased bulls in the herd) inevitably and ruinously infected the females with which he copulated. It would be quite as unjustifiable to say that the females did not also infect the males and that the infection was freely and abundantly passed to-and-fro between the two sexes in copulation.

It has already been remarked that the exposure of the male to infection from the female, during coitus, is logically not so great as to the female from the male. Clinically that appears to be true. In this instance, however, there was a remarkably intense cervicitis, the cervical mucosa was much swollen, intensely congested, bright or dark scarlet and secreting a considerable volume of pus which kept the vagina constantly polluted. There was generally (except there had been surgical handling since last coitus) a definite collection of 0.5 to 1 cc of pus in the cervical canal. It was the most virulent and universal outbreak of genital infection that I have seen in a large herd. These considerations suggest with much force that, while some infections of the vagina, like the abortion bacillus of Bang, may have little danger for the male, there are infections of such intensity that it will be exchanged between the two sexes with as great fidelity as syphilis, gonorrhea or dourine and cause well-nigh as great havoc.

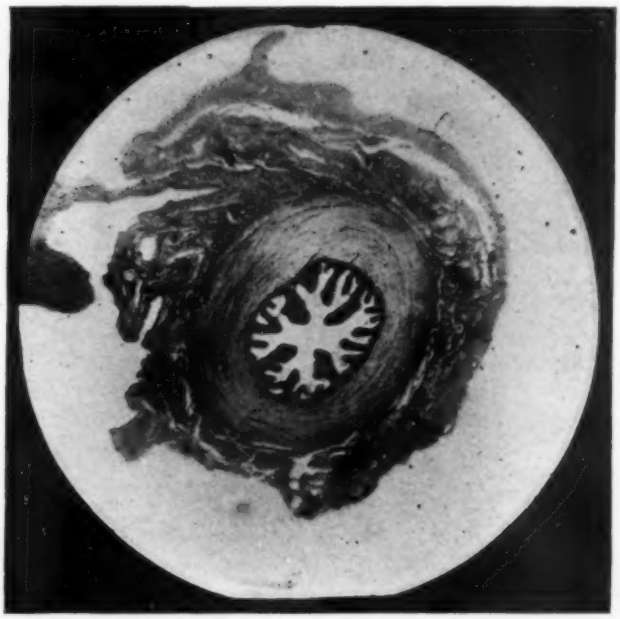


Figure 13. Cross section of healthy oviduct.

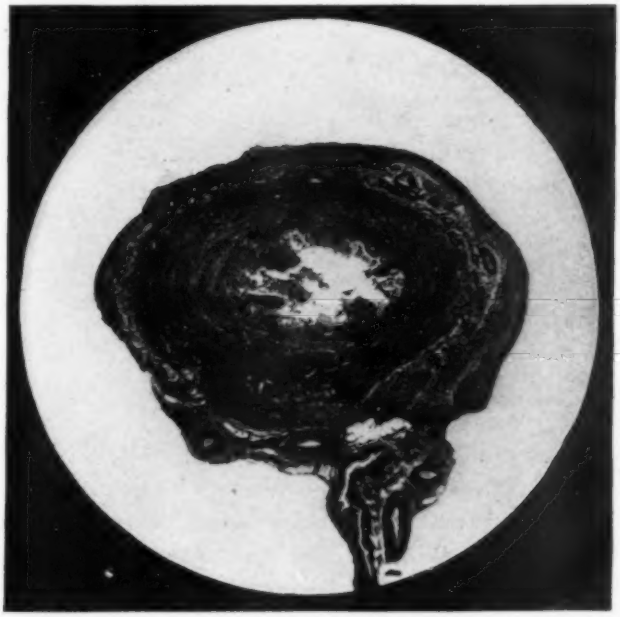


Figure 14. Cross section of diseased oviduct (chronic catarrhal endosalpingitis) showing lesions essentially the same as observed in the tubuli seminiferi, epididymal tubules, vasa deferentia, and seminal vesicles of the bull. The bacterial culture obtained from each of the several structures have been essentially identical. From the same herd as bull H.

To complete the picture it will be necessary to study Chart IV, wherein is shown the contrast in breeding efficiency, after the original herd had been practically wiped out, and young stock grown carefully from the intensely infected parents, being sexually healthy, were mated. The number of breeding females

CHART IV

COMPARISON OF BREEDING EFFICIENCY OF HERD IN 1917 WITH 1921

	Total Cows and Heifers of Breeding Age	Pregnant or Calved within 3½ Months	Heifer Calves and Heifers under Breeding Age
1917	103	53	11
1921	68	67	32

has been reduced 33.6%, the number pregnant or calved within 3½ months advanced 26.4%, and the number of young females not yet in breeding increased 190.9%.

A single outbreak does not clearly establish the full meaning of the power of the male to transmit genital infections. Each herd and individual presents a separate picture and it is only by studying the subject from many points of view that the problem can be made to stand out clearly. The above herd was saturated through and through with a virulent infection at the commencement of the observations; there were no traces of any introduction of infection from without.

In a second herd the introduction from without was clearly traceable. A herd of purebred Holsteins had been breeding quite satisfactorily. It became desirable to introduce a junior sire for heifers and for some of the cows. A young bull, not previously used, was purchased and placed in service. His females immediately became diseased while those of the old bull continued to do well. They were all together in one paddock and barn and were cared for by the same attendants. Sterility was rampant in the females served by the new bull, but the genital organs of the cows which had not succumbed to acute metritis were apparently healthy. An examination of the young bull showed that he had an abscess of the left seminal vesicle, which had ruptured into the rectum (as shown in Figure 15). Chart V shows the results of the copulations by each of the two bulls.

Figure 15. Diseased seminal vesicles from Bull II in Chart V.

1, Pelvic urethra covered by prostate gland and Wilson's muscle; 2, body of prostate; 3, ampulla of right vas deferens pulled to the left by the abscess; 4, 4, right seminal vesicle, about normal in size; 5, 5, 5, large hard abscess of left seminal vesicle; 6, portion of interior of rectum, adherent to abscess and showing a fistulous opening in the incision through which the pus from the abscess escaped into the rectum; 7, urinary bladder, upper half cut away.

CHART V

BREEDING RECORDS OF HEALTHY AND DISEASED BULLS IN A PUREBRED HERD

Yr.	Bull	No. Cows	Copulations	Sterility		Abortion		Calves		Metritis[1] %		Average Duration of Gestation days[2]	Herd Increment (%)[3]
				No.	%	No.	%	No.	%	Fatal	Recov'd		
1918	1	27	40	1	3.7	0	0	26	96.3	0	0	285.96	96.3
1919	1	20	22	2	10.0	0	0	18	90.0	0	0	285.06	90.0
1920		15	20	2	13.3	1	6.7	14	93.3	0	0	282.79	93.3
1919	2	13	19	1	7.8	3	23.1	9	69.2	23.1	15.5	278.44	46.16
1920		21	30	4	19.0	5	23.8	12	57.1	0	19.0	276.0	57.14
1921	1(a)	3	3	0	0	0	0	3[4]	100.	0	0		
1921	1(b)	15	22	5	33.3	1	6.7	9[5]	60	0	0		
1921	3(b)	6	7	6	100.0								
1921	4(b)	3	3	2	66.7	0	0	1	33.3				

[1]Only marked clinical cases of metritis or retained fetal membranes included; [2]abortions not included; [3]herd increment = calves added by births less cows dead from genital infections; [4]two had calved and one remained pregnant; [5]pregnant at date of report, (a) not previously bred to No. 2; (b) previously bred to No. 2.

Such a picture is frequently seen in herds but there is also observed another very striking phenomenon. It sometimes occurs that a bull is used jointly for a year or two in two herds. In one the breeding is highly satisfactory while in the other abortion and sterility are rampant. This is regarded by many as destroying the force of the belief that in this case the young bull was the offender. But such cases do not detract from the conclusions logically drawn. This is borne out by studying Chart V for 1919-1920, and then comparatively for 1921 after bull 2 had been destroyed. There it is shown that females which had previously been bred to bull 1 only, continued to breed well but those which had been bred to bull 2 and later to bull 1 did very badly. The reason for this disparity seems clear. Bull 2 had lodged serious infection in the genitalia of his females which greatly lowered their breeding efficiency. Bull 1 did not contract, at least immediately, the infection from number 2's females, perhaps largely because the genitalia of the infected females had been carefully disinfected.

The fact that in two herds, jointly served by one bull, the females reproduce splendidly in one while in the other genital diseases are virulent and reproduction very poor, merely shows that the bull then in service is not disseminating infections. Such an observation indicates only that a healthy bull does not transmit genital disease. But the diseased herd of females may nevertheless have become infected by an earlier bull.

Another interesting group of data may be drawn from an extensive breeding stud. Several stallions were in service, some of the most heavily used being shown in Chart VI. There had been much abortion, but both mares and stallions had been given abortion bacterins. This group of animals constitutes a part of those reported upon by Koon and Kelser[4], in which they enthusiastically claim to have controlled equine contagious abortion. They do not state just what they mean by contagious abortion, but Chart VI makes it perfectly obvious that, from the standpoint of reproductive efficiency, the stud remains absolutely bankrupt.

CHART VI

BREEDING OPERATIONS IN A STUD DURING 1920-1921.

	Total Stallions Used	Total Mares in Stud	Total Breeding Years	Total Copulations	Number of Conceptions	Number of Copulations per Foal	Number of Foals	Number of Abortions	Percent of Foals per Annum	Percent Abortions	Percent Sterility
	36	83	96	227	56	4.5	50	6	52.1	6.2	41.7
Record of 5 leading Stallions	No. 1	19	27	3	13.5	2	1	10.5	5.3	84.2
	No. 2	19	23	12	1.92	12	0	63.1	0	36.9
	No. 3	17	23	7	3.23	6	1	35.3	5.9	58.9
	No. 4	12	13	4	3.25	4	0	33.3	0	66.7
	No. 5	12	12	2	6	2	0	16.7	0	85.3
Mares served by No. 1 and later by other stallions		17	53	5	13.25	4	1	23.5	5.9	70.6

At the date of preparation of the chart it had required 4.5 copulations for each conception, but there were wide variations in stallions. No. 1 made 9.0 copulations per conception. Of his three pregnancies, one was aborted, one continued for 12 months and a pigmy foal was dropped and one healthy foal was produced. He thus produced one valuable foal with 27 copulations. It is to be remembered that the stallion and his mares had all been "cured" of contagious abortion by the use of bacterins, so that the low efficiency cannot be attributed to that complaint. It must be clear, however, that pre-natal death occurred, but at a date which did not result in the observed expulsion of a fetal cadaver.

The veterinarian in charge studied the breeding problem well and kept a close check upon the character of the semen. That of stallion No. 1 contained motile spermatozoa, though they were less numerous, and the movements less vigorous, than those of other stallions. When at the end of his career, as is the general rule with heavily-used, genitally-diseased males, the sperma-

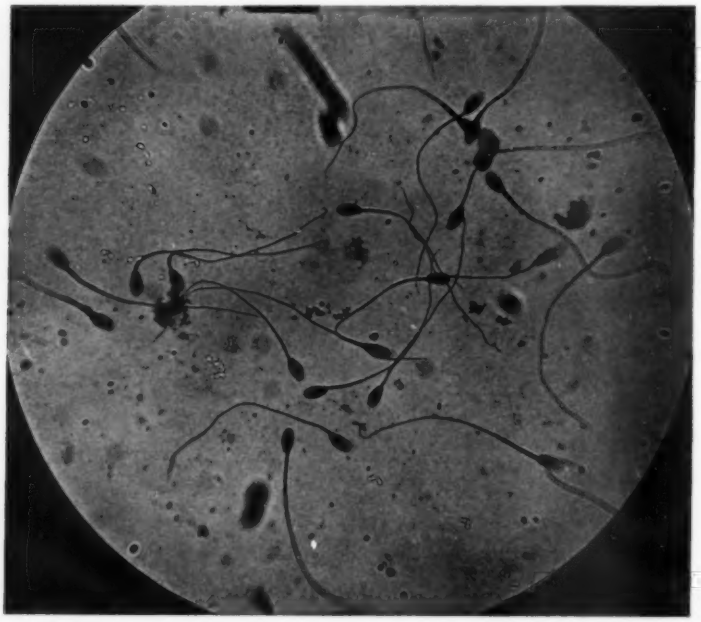


Figure 16. Healthy spermatozoa from one of the fertile stallions in Chart VI.

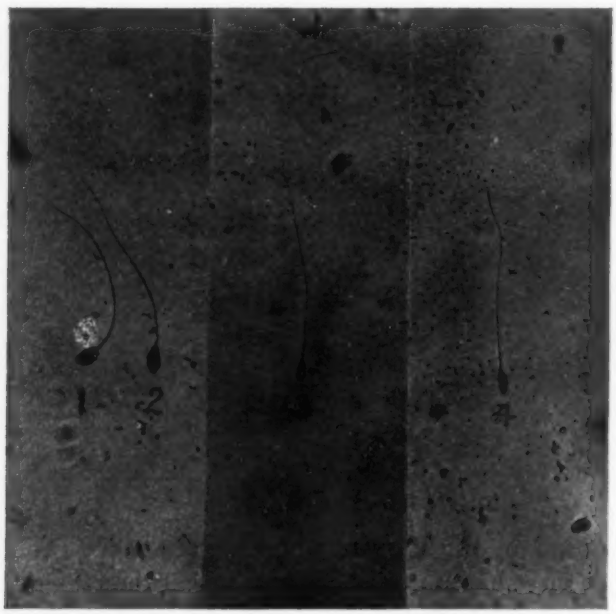


Figure 17. Diseased spermatozoa from Stallion 1 in Chart VI. Spermatozoa were so few that it required photographing three separate fields to get four spermatozoa. All are diseased and all parts take stains alike so there are no visible lines of division between the various parts, in contrast with the preceding figure of healthy cells.

tozoa became very few in numbers, non-motile, abnormal in size and form and the dead cells took the stain equally in all parts, as shown in Figure 17, in sharp contrast to the appearance of spermatozoa from a healthy stallion (Fig. 16) in the same stud. In order to get four spermatozoa into one picture, three fields had to be assembled. Up to the time of withdrawal from the stud he was therefore fertile upon the basis that he was ejaculating motile spermatozoa and he was free from contagious

Figure 18. Genital tract from healthy stallion, seen from in front.
A, A, ampullae of vasa deferentia; B, urinary bladder; V, V, vasa deferentia; E, epididymis; E¹, section through epididymis; T, testicle; T¹, section through testicle; S, S, seminal vesicles; P, P, prostate glands.

abortion, according to the standards applied by Koon and Kelser.

A further study of the mares bred to No. 1, and later to other stallions having satisfactory breeding histories when mated with other mares, disclosed the fact that 13.25 copulations were required for each recognized pregnancy. These mares had been fertile before they had been bred to No. 1. The genital organs of these mares showed no noteworthy lesions but something had occurred rendering conception almost impossible. As with Bull No. 2 in Chart V, so here the evidence indicates that a highly infected male had transmitted in coitus an infection which not only killed the ova, which it was designed to fertilize, prior to the abortion stage, but had implanted a permanent infection in the female genitalia which barred impregnation by fertile males used subsequently.

Seventeen of the mares bred to No. 1 were later bred fifty-three times to fertile stallions and produced four foals. If the twenty-seven copulations made by No. 1, and the fifty-three copulations made by fertile stallions with the mares previously served by No. 1, are deducted from the total copulations, there was one foal born for each 3.3 copulations. So it is indicated that if the mares bred to fertile stallions be divided into two groups, analagous to two herds, the one group not previously bred to No. 1 required 3.3 corpulations per foal and those previously served by No. 1 required 13.25 copulations per foal. Some would say, as has been often said, here are two herds served by one male, one of which reproduces well, and the other almost not at all, *hence the male does not transmit genital infections.* BUT THE OBSERVATION IS MADE UPON THE WRONG MALE. Upon physical examination No. 1 revealed extreme atrophy of the testicles with greatly enlarged seminal vesicles. He was destroyed some months later, after a long sexual rest, during which his seminal vesicles almost resumed their normal volume.

The post-mortem study of stallion 1 showed the extreme atrophy of the testicles which had been observed clinically. Figure 18 shows the genital tract of an apparently sound stallion and Figure 19 illustrates the diseased genital organs of stallion 1. Comparison of the two testicles, in section, brings out clearly the atrophy of the diseased gland. Most of the mass regarded clinically as the testicle proves to be epididymis instead. The tunic of the testicle of stallion 1 is greatly thickened

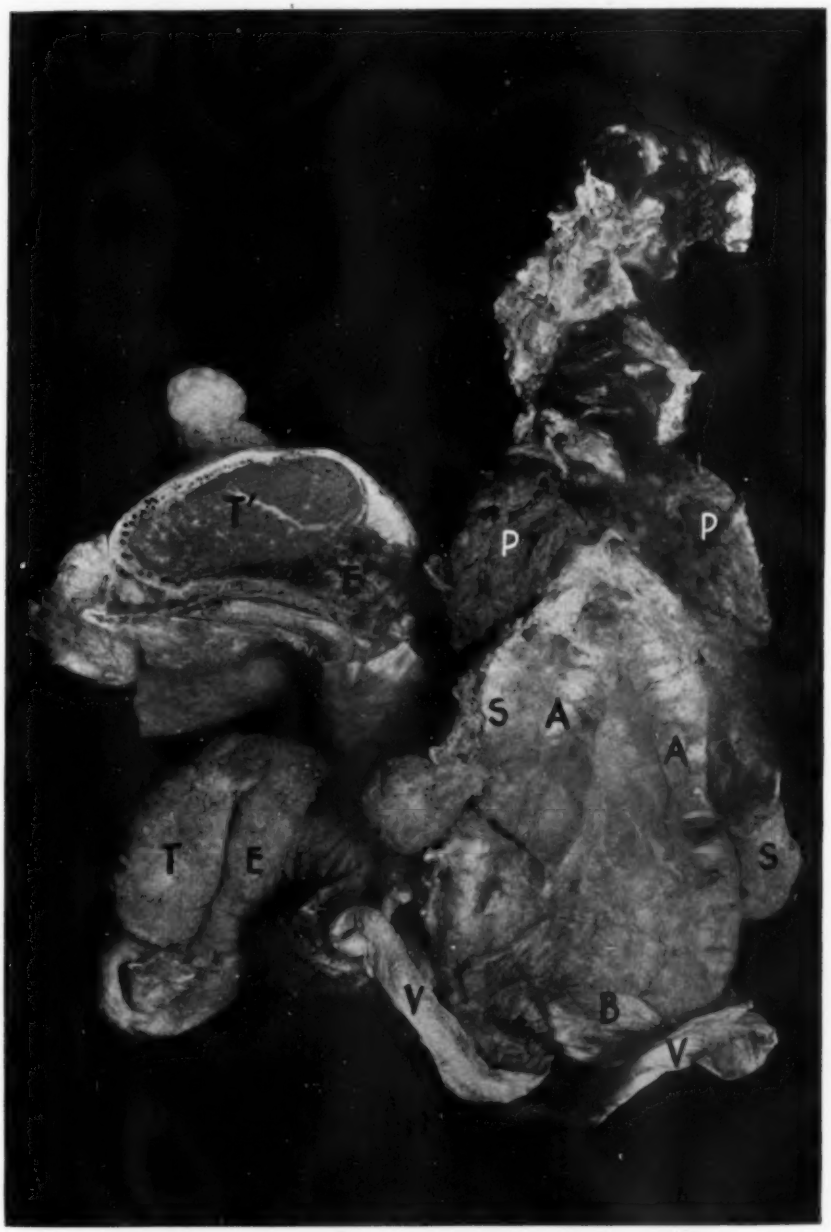


Figure 19. Genital organs from diseased stallion (No. 1 of Chart VI). Lettering same as in Fig. 18. Note that the testicle, T, is rough on its surface, and in section T^1 that the gland is much smaller while its coverings are greatly thickened and show many large blood-vessels (black). The prostate glands, P, P, are enlarged.

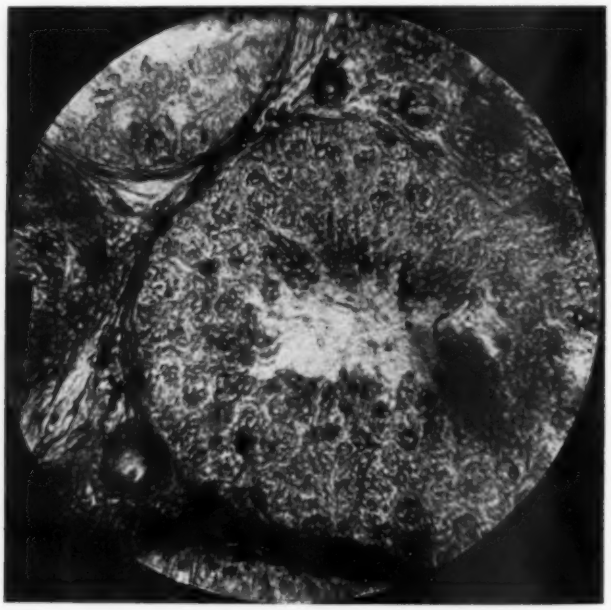


Figure 20. Healthy seminal tubules of stallion x 750.

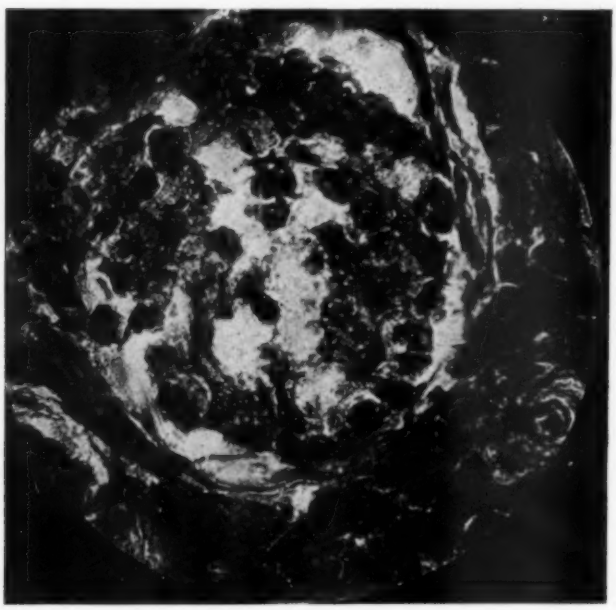


Figure 21. Diseased seminal tubules from stallion 1, Chart VI, showing destruction of epithelium, x 750.

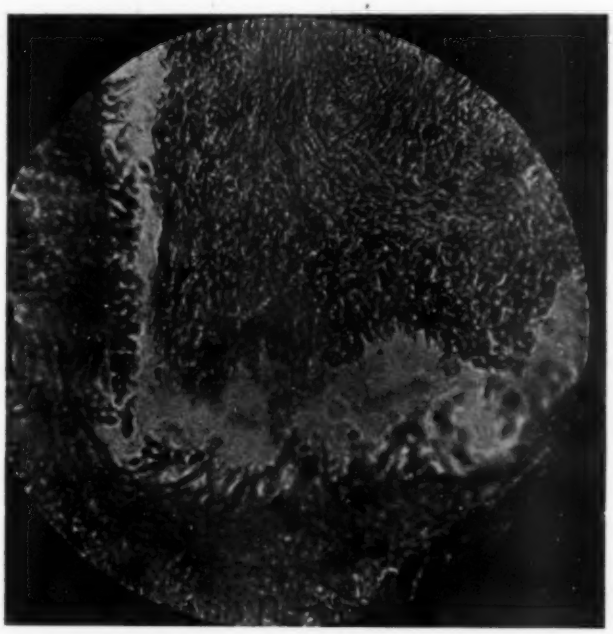


Figure 22. Healthy tube from epididymis, x 750.

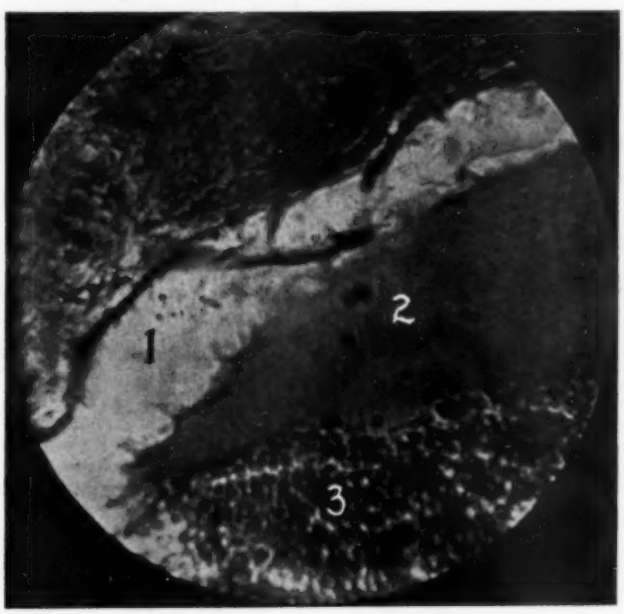


Figure 23. Diseased tube from epididymis of stallion 1, Chart VI.
1, Lumen of tube, with loss of epithelium; 2, lymph clot; 3, red blood-cells from hemorrhage into tube.

and shows numerous dilated blood vessels. The epididymis of stallion 1 is greatly enlarged and the coils of the tube are distended with blood.

Microscopic sections reveal that the seminiferous tubules (Figure 21), as compared with the healthy (Figure 20), have lost their epithelium by desquamation. The epididymal tubules, as shown in Figure 23, in comparison with the healthy in Figure 22, have lost their epithelium and extensive hemorrhages have occurred in their lumens. The *ampulla* of the *vas deferens* of stallion 1, as compared with the healthy in Figure 24, shows great enlargement of the diseased tube with a narrowing of the lumen. The glands of the ampullar walls are vastly enlarged and filled with firm masses, apparently disintegrated spermatozoa encased in mucus.

As in bull H, previously described, so in stallion 1, his breeding record, the clinical examination, the examination of his semen; and post-mortem, the microscopic sections of testicle, epididymis and ampulla are in perfect accord throughout, and forge about him an incriminating chain of irrefutable evidence.

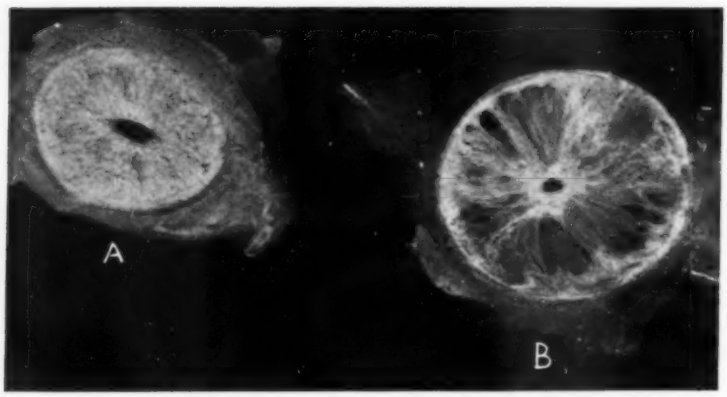


Figure 24. Cross sections of healthy and diseased ampullae.
A, healthy ampulla with uniform wall and large central canal; B, ampulla from stallion 1, Chart VI. It is greatly enlarged, its walls thickened and its lumen greatly diminished. The glandular structures are filled with hard masses, probably disintegrated spermatozoa bound together with mucus.

There was another stallion in this stud which is highly interesting, but was not included in the chart, because when it was made the results of his copulations were unknown. He had come into the stud recently and being a magnificent individual was

generously used. His genital organs appeared healthy in all respects. He ejaculated abundant, highly motile spermatozoa, but these presented an interesting and puzzling anomaly. Most of the cells had an elliptical enlargement located in the body or middle-piece, just behind the head (as shown in Figure 25). It was one-half as long and wide as the head. When the spermatozoa were fixed and stained the swellings largely disappeared, but remained clearly traceable in many. This defect is occasionally seen in equine spermatozoa but in this stallion it was the rule. I expressed the belief that the stallion was sterile and probably highly dangerous. None of his mares conceived. They were later bred to other stallions of known fertility, but none became pregnant. Here was a vigorous stallion, discharging plenty of semen, with abundant, highly motile, but anatomically imperfect spermatozoa. Yet he was infertile and highly infective.

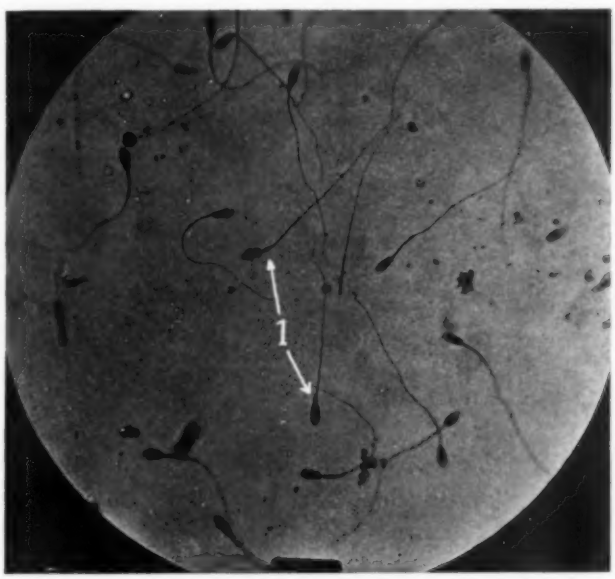


Figure 25. Diseased spermatozoa from an apparently healthy stallion. Note at 1 the peculiar enlargement in the bodies of the spermatozoa as described in the text.

It is very interesting also to consider that the anatomic fault was apparently a persistence of the characters of spermatids, and that the swollen portion was merely the protoplasm which is physiologically present shortly prior to the maturation of the spermatozoon. In other words, for some reason, the spermatozoa

had been shed prior to the completion of their development. Hence one might assume that for some reason other than infection, the ripening of spermatozoa was interrupted and premature discharge occurred. Were this so, then the injury would not go beyond non-fertilization by the male and the substitution of a fertile male would remedy the defect. Instead, the mares served by the diseased stallion were sterile when later bred to fertile males. Hence the inescapable conclusion is that the premature shedding of spermatozoa was due to an infection which was transmitted to the females in persistent form.

A study of Chart V shows that the duration of pregnancy in the females bred to bull 2 was about 7.5 days shorter than for bull 1; they were prematurely born. Some observing breeders regularly destroy prematurely-born, heifer calves because they usually fail to conceive, or becoming pregnant, abort. My observations indicate that it may be safely predicted that most prematures will prove sterile or will abort. Several colleagues who are active in the field of genital infections of cattle have made identical observations. It consequently appears from the comparatively limited observations available that prematurely born heifer calves are generally sterile or they abort. If this is true of heifers, the same must apply to prematurely-born bulls.

I have not yet obtained data upon the breeding efficiency of the progeny of bull 2 of Chart V, but it is reasonably certain that their showing will be bad. It is worth while, therefore, for the veterinary practitioner to study carefully not only the power of the male, with severe genital infections, to infect seriously the females with which he copulates, and the pre-natal young which he begets, but the more far-reaching problem of transmitting to his living progeny an enduring infection which will lower their fertility at breeding age. This problem has had little study. It is a common observation that a cow which conceives with difficulty, aborts, produces few calves, or raises heifers which prove poor breeders. The available data also indicate with much force that the bull with severe genital infection gets progeny of low fertility. This is well demonstrated in Chart VII, showing the breeding records of three prominent bulls in a large herd.

Bull 2, with 691 copulations, got 32% of calves, while bull 3, with 213 copulations, got 50% of calves. The fertility of bull 2 was 36% lower than that of bull 3. The 85 heifers of bull 2 produced 1.9 calves each and the 44 heifers of bull 3 produced

CHART VII

CHART OF THREE BULLS IN A LARGE HERD

Bull	Year	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	Total	Female Progeny	Calves Produced by Female Progeny
1	Copulations		4	21	48	77	45	16	2			213	32	41
	% Calves		50	48	40	34	22	19	0			33		
2	Copulations	8	39	82	117	73	106	106	86	64	10	691	85	163
	% Calves	100	33	34	32	27	39	27	26	28	90	32		
3	Copulations	23	70	61	37	35	6	0	3	2	1	213	44	162
	% Calves	83	54	33	41	40	0	0	33	0	0	50		

3.7 calves each, so that in the second generation bull 3, as a result of 213 copulations, had as many progeny as bull 2 with 691 (three times as many) copulations. Clearly, from the reproductive standpoint, bull 3 was by far the more valuable sire. Bull 1 did most poorly of the three, his 32 heifers producing but 1.3 calves each.

It is highly instructive to study the even decline of fertility in bull 1. If the fertility of the other two bulls is studied it will be seen that in these also there is a gradual but less regular decline from year to year. It is especially notable that the greatest drop in fertility occurs as a rule in the year succeeding the heaviest use. It appears to indicate that severe use of a male depresses his fertility and that it will show most definitely at some time subsequent to the strain. In one instance where a bull was very severely used he was totally sterile the next year.

Bulls which have been closely studied show first of all defective spermatozoa after fixing and staining, and the influence of frequent coitus upon the increased proportion of defective cells. If timely sexual rest is given the quality of the spermatozoa usually improves promptly. It is a not uncommon custom among breeders to crowd a bull (or boar or ram) very hard for one or two years and then discard him, partly because he has young females of breeding age and largely because the breeder believes (and he is usually right) that the young male is more "sure", and this is a part of the breeder's handiwork. A bull should be as fertile at 20 as at 2 years old, and will generally be so, if prudently handled. Some individual males have extraordinary sexual vigor, which means sexual health, and such animals have records of great numbers of progeny. Breeders have mistakenly concluded that any other male of the same species can duplicate the performance. The ability of a male to

copulate successfully a given number of times during a certain period, depends primarily upon his sexual health, and that varies greatly in individuals. Some arrive at breeding age already hopelessly sterile; others have low fertility with high infectiousness; others high fertility with low infection. If the highly fertile male is properly used, his fertility persists as long as the general health remains unimpaired.

The above data have been selected because of their illustrative value, from among abundant material occurring in domestic animals of all species. Identical experiences are had in sheep and swine.

The power of the male to transmit serious and destructive infections to the female and thence to her intra-uterine young, is an undeniable fact in all mammalian life. Veterinarians and breeders have as a mass failed to recognize this fact adequately and fully, and have, in line with well entrenched tradition, regarded the female as responsible for essentially all failures in reproduction. Technically they have admitted that somehow the male was necessary to reproduction and have kept sires for that purpose. In rare instances they have admitted that the male failed to cause conception but the infections in the female organs, could not, to their minds, be transmitted by the male. There is a bi-sexual standard; the male has male infections and the female suffers from "female complaints."

In the intense economic struggle of recent years it is desired to grow the maximum number of young from the best males and females of the species. In this struggle the superior male has taken an exalted place. Animal husbandry has, as one of its chief factors, polygamy and among the most vital problems is its prudent and efficient control. The problem has not been at all studied until very recently, and is now attracting the attention of a mere handful of observers; the great mass of veterinarians and breeders have their attention irremovably focussed upon a "female complaint" designated "contagious abortion" and they are unwilling or unable to assign to the male an important role in genital disease.

Recently an extraordinary effort has been put forth by highly influential organizations to exalt and intensify the innocence of the male in the transmittal of genital infections. At the head of these organizations is the United States Department of Agriculture through its Bureau of Animal Industry, ardently seconded by the American Veterinary Medical Association,

which represents the veterinary profession of the United States and Canada, and the United States Live Stock Sanitary Association which represents veterinary and lay officials engaged in the control of animal diseases in the United States.

Speaking officially for the United States Department of Agriculture, before the United States Live Stock Sanitary Association, Dr. E. C. Schroeder[5] states:

"The discharges from the male sexual organs may be dangerous when the bull is permitted to run with the herd, and hence, in the control of bovine infectious abortion it is desirable that he should have a separate pen, away from the cows, and that he should be permitted to serve cows only on neutral ground, or ground to which cattle do not have access at other times than during that of service. It may also be wise to segregate cows after they have been served by possibly infected bulls until all danger that infected seminal fluid may leak from their vaginas has passed, and to fasten them during such segregation in a way that will prevent them from eating anything that may have become soiled with leakage from their vaginas . . . . . .

"The community or association bull evidently is harmless so far as infectious abortion is concerned, and he is so without elaborate and troublesome disinfection of his genital organs, provided the precautions already suggested, a bull pen, service on neutral ground, etc., are observed . . . . . .

"A search for other specific causes of abortions among cattle has not been neglected, and Bureau investigators could relate at great length stories similar to those other investigators have told about micro-organisms isolated from the products of abortions and the uteruses of cows that have aborted. Bacilli of various kinds, different types of micrococci and spirilla or vibrios repeatedly have been found, but when their pathogenicity has been tested in accordance with widely recognized and accepted and required bacteriological standards, not one shred of evidence has been obtained to prove them true etiological factors of bovine abortions."

It will be observed by the careful reader that in these citations Schroeder is not definitely concerned with the problem of genital infections and their influence upon reproduction, but wholly with "contagious abortion" and in the last paragraph cited he leaves the impression, without clearly so stating, that "contagious abortion" due to the abortion bacillus of Bang constitutes the sum total of all pre-natal or intra-uterine infections of consequence.

The Abortion Committee of the American Veterinary Medical Association for 1922, of which Schroeder was a member, incorporated the first paragraph above cited in its report, and this was adopted by the Association without opposition.

Dr. Schroeder's paper was promptly published, Jan. 6, 1922, and enthusiastically endorsed by Hoard's Dairyman, and a little later by various breeders' and dairy journals.

The attitude of the United States Department of Agriculture, as voiced by Schroeder, although wanting in precision, is highly dangerous and a serious peril to the breeding interests of the nation. The injury is not so directly due to what Schroeder

said as to what he omitted to state. The principle is well illustrated by the paper of Koon and Kelser[4], to which reference has been made. They claimed to have eradicated, controlled or otherwise placed *hors de combat* contagious abortion in the army remount stud, but as shown by Chart VI and Figures 16 to 25, while abortion was scarce, foals were rare and destructive genital infection rampant. One reading the contribution of Koon and Kelser would think their use of killed bacilli had accomplished great good, but the facts prove otherwise. Koon and Kelser did not say they had raised the breeding efficiency, but the average reader would think they so meant it. I am credibly informed that Koon and Kelser knew the facts recorded in Chart VI; at least the facts were available to them. The facts did not, in their judgment, form a part of contagious abortion and did not therefore have anything to do with their paper. This is, in brief, the general attitude: if bovine infectious abortion (due to the Bang bacillus) is present, it is of great importance, but if some other genital infection is present and causing indescribable injury to the breeder, that is of no interest and must not be mentioned. It is interesting to note that those who hold this view have not yet advised breeders how a herd of cattle would behave if contagious abortion were eradicated and they are left to assume that it would breed perfectly.

The facts above recorded are plain and unanswerable. Whether the destructive infections were or were not the Bang bacillus in the cows and the bacillus of equine contagious abortion in the mares is of no material concern to the breeders' bank account. The infections were perhaps not "contagious abortion" in either case, but they were highly destructive, ruining the herds, and, most important of all, they were undeniably transmitted by the male in copulation. If a rose were called a lily, the thorns would still prick.

When writers of great influence state certain things which may be correct, but omit other unchallengeable facts which have a vital bearing upon the problem under discussion, and thereby permit a highly perilous conclusion to be formed, they assume a great responsibility.

Hoard's Dairyman and other influential live stock publications hailed Schroeder's paper as freeing the breeder from the necessity for taking precautions in the handling of the male, which had to some appeared irksome and expensive. The breeder is led to believe that douching of the copulatory organs is unnecessary

or even injurious, that a genitally unsound male may be used with safety and with good results, that the guarding of the sexual health of the male and that the observance of the most common and obvious laws of sexual decency in animal breeding are useless if not injurious. With such teachings go great perils.

Chart VII shows well the evils of sexual excess and shows graphically what constituted sexual excess for those bulls. Whether they were average bulls or not cannot be definitely stated, but until better data are at hand these should be thoughtfully considered. The United States Department of Agriculture (Farmers Bulletin 993) strongly advocates "community bulls", and many agricultural colleges have taken up the propaganda. The community bull goes into a number of herds and exchanges infections with each cow in each herd. The plea is made that by purchasing in a cooperative manner a high-class, pure-bred bull, he may be made to replace four or five grade bulls. That is precisely one of the elements which is lowering the reproductive efficiency of pure-bred animals—the attempt to have one male do the work of four or five.

One of the recommendations of this bulletin is that "only one satisfactory leap shall be permitted at each service; no bull shall serve more than two cows in one day, nor more than seven in a week, nor more than seventy-five in one year." This is a rate of service which, according to the data in Chart VII is imprudent and disastrous. The maximum of seventy-five cows in one year may mean 100 or (seven in one week) 365 copulations. Elsewhere it is stated, "If the bull is mature and vigorous and the breeding is carried on evenly throughout the year, the number of cows in a block may be nearly 100." Available data indicate that upon the average a bull makes 2.5 copulations per pregnancy. This would mean 250 copulations per annum, which would ruin probably four out of every five bulls, intensify the infections in their genital organs and spread destruction and ruin in his wake.

There is at present no good excuse for incurring these risks and producing such disasters. A bull may be purchased subject to such an examination of his genital organs and semen as above outlined and such examination, in competent hands, is reliable. The male which is not "sure", but still a breeder, is a menace, and deserves watching. The male in service may be watched and frequent examinations made so that any signs of danger may be heeded. Above all else the breeder should learn that the

male is no more capable of unlimited copulation than he is of consuming an unlimited amount of food or traveling an unlimited distance. The veterinarian and the breeder needs to learn the first and most important maxim in the production of abundant, healthy young: *Mate two sexually-healthy individuals.* The breeder needs as early as possible to free himself from the centuries-old tradition that females have genital infections or "female complaints" in which the male may not participate.

That the cooperative use of bulls may be of very great value is freely conceded; but its immense perils should be equally recognized. While it is possible, as contended by its advocates, that "bovine infectious abortion" may not be so spread, it is very certain that genital infections, perhaps having no direct relationship to contagious abortion, can be thus transmitted and bring ruin to the herd and its owner. If any one member of the block imprudently breeds a dangerous cow, all the herds in the entire block will be imperilled. It is better to think wisely before embarking upon "cooperative-bull" schemes than to think too sadly about them a few years later. The thoughtful student of genital infections, whether veterinary practitioner or breeder, has ample opportunity for making careful observations upon the sire as a spreader of sexual diseases and will frequently find evidence which indisputably proves that the male is a potent factor in ruinous diseases interfering with reproduction.

In the preparation of this contribution, I am under profound obligations for assistance by Drs. C. M. Carpenter, S. A. Goldberg and W. W. Williams.

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GENERAL FACTS TO BE CONSIDERED BEFORE THE ADMINISTRATION OF THERAPEUTICS*

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HISTORY OF THERAPEUTICS

The treatment of disease originated no doubt when primitive man cared for himself and his animals in case of sickness. Perhaps, instinctively, as in the case of some animals, he modified his diet when sick, sought rest and seclusion and in certain cases procured some unnatural substance for food. No doubt remedies were sought much in the same manner as were foods. That is, numerous things were tried for their effect upon some particular trouble. If good effects were obtained their use was continued; if disastrous effects were obtained, they were left alone.

The earliest authentic account of medicine is found in the scriptures. The writings of Moses contain many passages relative to it. It is said that the early Babylonians exposed their sick upon the highways and asked the passers-by if they knew of some remedy for the disease. In ancient Egypt the priests were among the first healers and kept their records of recipes for the cure of various diseases on tablets in the temples. As the treatment of disease became too extensive a subject to be handled by the same person who administered to the soul, the care of bodily sickness became a speciality, practiced by men who gave their entire time to it. In this manner arose our first physicians.

In the early days the practice of medicine was shrouded in mystery and religion. Drugs were used solely from reputation and recommendation. Little if any attention was given to their method of action. Usually a drug was employed because it was customary to use it in such a condition. Observations were inexact and were not controlled by scientific methods because the course of a disease could not well be prophesied. If a patient recovered, credit was given to the medicine; if he died from the effects of the medicine, the death could be laid to the severity of the disease.

The study of medicine up to our present time, has passed through a variety of changes until we have the following methods of treatment.

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Expectant: This means an absence of any real treatment beyond hygiene, rest, diet, etc. The object of this is to give nature full play. This method should always be practiced where no better treatment is known or when it is desired to let the disease progress for diagnostic purposes.

Symptomatic: This is aimed at the symptoms of a disease without reference to its cause. It may be indicated in some cases and contra-indicated in others. In striking at the symptoms one sometimes strikes at the disease. Again, the symptoms may be disagreeable or lead to such secondary results as to make their removal desirable. It must always be considered that in removing the symptoms we sometimes remove the only index to the disease or main disorder, as is the case of pain in colic. It is always necessary to be on the alert as we may sometimes think a disease is cured when really only some of the symptoms have been removed.

Empirical: This method consists in following the dictates of experience without regard to the reasons for the actions of the medicines. This method is necessary occasionally, but may result injuriously in many cases, because similar conditions may need different treatment.

Rational or Scientific: This method makes use of the three preceding, but has as its aim the removal of the cause of the disorder and to influence favorably the course of the disease. It depends upon pathology, physiology and pharmacology, and is often divided as follows:

1. Dietetic, including qualitative and quantitative changes in diet.
2. Physical and physico-chemical, including the application of heat, cold, massage and electricity.
3. Medicinal.

Rational therapy is the hardest of the practical subjects to master, and it is safe to say that the young veterinarian, even after a college course, is less prepared in the "stall" management and the office treatment of disease than in any other branch of veterinary medicine. At his school the hospital and dispensary cases were necessarily handled in a general routine manner. The patient was not individualized. In the hospital, the diet, bathing, electricity, massage, drugs and preparations were always given and used according to some one rule which can not well be varied in these institutions to suit an individual taste or need. Hence the graduate, and even the post-graduate,

unless he has especially studied therapy, starts his individual practice positively handicapped. He has no resources if his first dogmatic treatment has failed or was not suited to the patient.

All successful quackeries succeed because of their ability to relieve symptoms or to cause such mental suggestion as will relieve the overtaxed mind of the veterinarian or owner, and many a loyal client is driven to employ quackery by scientific neglect.

We have not sufficiently studied the various "pathies" and appropriated to our own use the small quantity of value which each may possess.

The old hobby of letting nature cure the patient has been ridden too long. Nature is a good mother but she will do just as much to propagate a pathological germ as she will to promote the welfare of the animal being infected by that germ. Consequently, neglect will not cure a patient.

The veterinarian must carefully study his patients, their symptoms and the result of his treatment and especially the results of medication. He must never confound his patient with the disease; it is the patient who has the disease that he is called upon to treat.

We hear of "natural-born" veterinarians, of intuitive sense and of great success in practice without much medical education and often without accurate diagnosis. This is true; a very scientific practitioner may fail on a clinical case, while a man with broad, keen intuitive sense will succeed. Common sense or horse sense, as it has been termed, is that ability to visualize all the knowledge applicable to the given case and then to note all the individualities of the patient and to modify the treatment accordingly.

Good therapy is an art. It requires high training, stored knowledge and good judgment to decide the proper hygiene, diet, exercise, rest, eliminative or antidotal treatment, and the physical measures, drugs, or surgery needed to cure a given patient. It is also just as important to know when not to use drugs that are contra-indicated in a certain disease; also after the diagnosis is made no two patients can be successfully treated in exactly the same way.

Unfortunately for the determinaton of what is rational and scientific therapy, we cannot dissociate ourselves from a deeply embedded belief in mystery in the treatment and cure of disease,

hence mankind, and the veterinarian is no exception, is impressed by cures by physical methods and by multiple or secret mixtures, when the cure is really brought about by nature or the resistance of the animal.

As just mentioned, we have not eliminated mystery from medical science, and still have a belief, unless we very carefully exclude it, in a multiple mixture, although it may not be a mythical mixture. We may know its contents. It is so easy to believe, when we are told that a drug in this particular combination has a particularly pleasant and efficient activity or that this particular kind of drug or preparation will not cause the disturbance that the well known and well tried basic drug causes.

We rarely need mixtures, whether Pharmacopeal, National Formulary, or Proprietary. Such mixtures may have value, but the active drug of the mixture can generally be given in a very simple manner and the results obtained be perfectly satisfactory, and the treatment be much more scientific.

A part of good therapy consists in the right use of the right preparation of the right drug. This object can be obtained only by a knowledge of the pharmacologic and toxic action of the best drugs, by a knowledge of their best preparations, and by a knowledge of how to administer them in proper doses. Consequently it is advisable that every practicing veterinarian should know the following, regarding every drug that he carries in his clinical case or prescribes in his every day practice:

1. The official English and Latin names and common synonyms, because the Latin name is used in prescription writing and the English names and synonyms are used in literature.

2. Source. This is important only in so far as some of the most widely used drugs are concerned.

3. Characteristics. Of only the most common and easily determined drugs. Form, color, taste, etc.

4. Composition of the inorganic, so far as the composition would influence its use or compatibility.

5. Active ingredients of organic preparations, alkaloids, glucosides, resins, etc. It is necessary to know upon what a drug depends for its action, as well as the source of some of the principles which are used alone. The composition is also important from the standpoint of compatibility.

6. Solubilities, so far as is concerned in the use of drugs.

7. Incompatibilities that are of importance in prescribing or using the drugs should be known.

8. Form in which drugs may be obtained and administered. Preparations and their strengths and doses, especially of the official and more commonly used unofficial preparations.

9. Physiologic and pharmacological action. Method by which the drug acts. Its action externally and locally, and upon the various systems of the body.

10. How it is absorbed and how eliminated.

11. Untoward and side actions. Whether there are any untoward or side actions must be looked after.

12. Uses or therapeutics. The uses can only be briefly pointed out in materia medica or pharmacology. The details should be worked out in the treatment of disease.

13. Contraindications. Conditions in which certain drugs are not indicated or in which they might do harm if given.

14. Administration. In what way, in what form and how often to use for different purposes.

We should also consider the factors which modify the action of drugs and these can be enumerated as follow:

1. Body Weight. It is obvious that it would be good practice to administer a definite dose according to the weight of the animal, as is done in pharmacological investigations, but it is not convenient to weigh animals in all cases and very difficult to estimate the exact weight. This method has been attempted. Take the weight of the horse at 1000 lbs. as 1, and estimate the dose for weights higher and lower than this. This has not proven very practical, and aside from varying the dose for large and small animals, is of little practical use.

2. Age. The age of animals is of considerable importance, but with the exception of a few drugs, which act more violently on young animals, is largely lost sight of, except as the dose is graded according to size. Weight is of more importance in veterinary dosage than age, because this varies so greatly in the different species handled.

3. Sex. In human practice women require less medicine than men, on account of their smaller size and greater susceptibility to any influences. In animals we do not see this difference, but irritant cathartics should be avoided during pregnancy on account of the liability to produce abortion.

4. Temperament—Race. High-strung animals are more susceptible than phlegmatic ones. This is particularly so in case of drugs acting upon the nervous system. The thoroughbred

or standard bred animals are much more susceptible than the draft type.

5. Tolerance—Habit. This is of little importance to veterinarians, as their patients are not addicted to drug habits, but we do occasionally find a horse which has been fed arsenic in sufficient amounts to become very tolerant to it.

8. Idiosyncrasy. This means an unusual reaction to a medicine or food. We occasionally find an animal in which ordinary doses of medicine will produce an unusual reaction or one in which extremely large doses are necessary to produce the usual reaction.

7. Species. On account of the structural and physiological variations in the different species of animals, the actions of drugs are not the same for all species. For instance, emetics do not usually produce emesis in horses, opium and its alkaloids cannot be depended upon to produce sedative action in the horse, and always produce excitement in the cat family. Dogs are very tolerant to morphine, but very susceptible to strychnine. Purgatives take much longer to act in herbivora than in carnivora or omnivora, etc.

8. Nature of disease. The nature of disease has considerable influence upon the action of drugs For instance, the usual sedatives may have little effect in quieting the severe pain of enteritis, Antipyretics reduce temperature in fever, but not when it is normal. In some febrile conditions, especially influenza of horses, the usual purgative dose of aloes is liable to cause superpurgation.

9. Object of medication. This may be illustrated by several drugs. Quinine is given in much smaller doses as a bitter than as an antipyretic; ipecac and apomorphine in smaller doses as expectorants than as emetics; strychnine in larger doses as a stimulant than as a tonic.

10. In general liquids are more active than solids, and alcoholic liquids more so than aqueous. Active principles are more soluble than crude drugs, powders and dry filled capsules than pills, uncoated pills than coated ones, and tablet triturates than compressed tablets.

11. Channel of administration. It has usually been considered that the hypodermic dose is half the oral, and the rectal twice that of the oral. However, in a number of instances, drugs are absorbed as rapidly from the rectum as from the stomach. The rate of absorption of different drugs from various channels

differs so greatly that no absolute rule can be applied. In intravenous medication the dose is small, because the drugs are injected directly into the circulation.

12. Time of administration. This is not of any great importance in large animal practice, because the stomachs of herbivora are never empty. In carnivora the action is usually more rapid if given before a meal, because the medicine will not be diluted with the food in the stomach.

13. Frequency of administration. It is impossible to give any rule for repetition of doses. In general, drugs which produce action very rapidly require frequent doses to maintain their action, while those which act slowly are not often given more than two or three times daily. It is obvious that the dose of a potent drug is less if it is given at frequent intervals than at longer ones.

In order that we may better understand and check up just what a practitioner should know about a given drug before he prescribes it, I think a thorough discussion of one of the more common drugs would be desirable here. I have chosen for discussion the drug oil of turpentine, which I am sure is familiar to all of you. It is not my idea that I shall bring out anything new in this discussion, but it will give us an example to go by.

Oleum Terebinthinae

Synonyms. Oil of Turpentine, Spirit of Turpentine.

Source. It is obtained by distillation with water from the concrete oleoresin obtained from the *Pinus Miller* or from other species of *Pinus* (Fam. *Pinaceae*).

Characteristics. This drug occurs as a thin, colorless liquid having a characteristic odor and taste. It is a volatile oil and acts as a solvent for resins, fats, wax, gutta percha, India rubber, sulphur, phosphorus, iodine and many alkaloids.

Solubilities. It is soluble in three parts of alcohol and insoluble in water.

Incompatibilities. Water and other substances with which it is not miscible.

Form in which it may be obtained and administered. It may be obtained as the oil of turpentine or the Oleum Rectificatum. The latter is prepared by redistilling oil of turpentine over a solution of sodium hydroxide. Either drug should be administered as an emulsion, in oil, mucilage or in capsule.

Physiologic and pharmacological action. Externally, oil of turpentine is an irritant to the skin, causing itching, pain, redness or even vesication followed by a local anaesthesia. It produces intense irritability and restlessness when applied externally to some horses. The oil is but feebly antiseptic and as there are many other much more valuable antiseptics and disinfectants we would not recommend its use for this purpose unless from extreme necessity. As a parasiticide, the oil diluted two or three times with some bland oil may be painted on the skin to kill ring worm or lice.

It is principally employed externally as a stimulant and a counter-irritant. It is one of the main ingredients in many of the liniments used in veterinary practice. The following will serve as an example.

℞

Pulveris saponis	℥ii
Olei terebinthinae	℥xxiv
Aquae ammonii fortioris	℥ii
Ammonii chloridi	℥iv
Aquae	q. s. Cong. i

Mix ammonia, soap and ammonium chloride in one-half gallon of water, shake, add turpentine and enough water to make one gallon.

The above preparation makes a creamy, white, stimulating liniment that will "stand up" if properly compounded. It will not blister unless confined under a bandage.

Turpentine is also valuable in various forms of inflammation, such as bronchitis, pleuritis, pneumonia, gastritis and enteritis, as it acts as a counter-irritant. It is probably of more service in the abdominal conditions and is best applied in the form of a turpentine stupe. To prepare a stupe of this kind we sprinkle freely, with the oil, a blanket or woolen cloth which has been previously wrung out of hot water. This is then applied to the abdomen or other part of the body, covered with some material to hold the heat and left on half an hour or longer according to the results desired.

Under certain conditions it is not always possible for the veterinarian to apply turpentine stupes, as the hot water, blankets, etc., are not available, and in this case the following prescription may be applied liberally to the patient's abdomen or chest as desired.

℞

Ol. sinapis	℥ii
Ol. terebinthinae	℥ii
Aq. ammonii fort.	℥ii
Ol. gossypii sem.	℥viii

M. Sig. Apply thoroughly once only to the abdomen of a horse suffering from enteritis. When a more severe counter-irritant or blistering is desired, the following combination of drugs will be found desirable. This combination forms one of the so-called "spavin cures" and should be applied once or twice daily with a brush until the area is blistered to the desired extent. To prevent permanent loss of hair the spot should be kept well greased with vaseline or some other like emollient, after the daily application of the blister has been discontinued.

℞

Tincturae iodi	
Tincturae cantharidis	
Olei cajuputi	
Olei terebinthinae	aa ℥ii

M. Sig. Apply with a small brush as directed above.

A stronger, liquid blister, but one that does not make quite so nice a preparation, may be compounded as follows:

℞

Hydrargyri chloridi corrosivi	
Camphorae	aa ℥ii
Olei terebinthinae	℥i

M. Sig. This may be applied for about three days with a small brush, omitted three days and repeated.

Internally oil of turpentine is of value as a carminative. It is very useful to relieve gastric tympany and flatulent colic in the horse and tympanites of the rumen in cattle. For this purpose it is usually combined with some preparation of ammonia and administered with linseed oil or in capsule. In these cases it causes the expulsion of the gas already formed and prevents fermentation, to which the condition is due.

℞

Spiritus menthae piperitae	
Spiritus ammoniae aromatici	
Olei terebinthinae	aa ℥ii
Olei lini	Oi

M. Sig. Give at one dose, for a horse or cow with flatulence.

Enemata can also be employed for their stimulant action on the nervous system and circulation in collapse. One or two ounces of oil of turpentine are dissolved in two to four ounces of cottonseed oil, when used as an enema for horses.

In purpura hemorrhagica the use of turpentine is of long standing. Good results often follow its use in this disease although its action cannot be explained satisfactorily. It is recommended by some as a hemostatic for internal hemorrhages from the nose, lungs, digestive tract, kidneys, bladder, etc., but it is inferior to other agents for this action.

It is used as an anthelmintic especially for round worms in horses, dogs and swine. It is also used as an intratracheal injection for lung worms of calves and swine. It is usually given in oil for its action on the digestive tract.

As an antiseptic expectorant it is of value in cases of subacute or chronic bronchitis, with excessive purulent secretion, but is thought to be inferior to some other forms of terebene. It is often used for its local action upon the respiratory tract in various respiratory diseases. For this purpose it may be added to hot water and the animal allowed or compelled to inhale the vapor (steaming).

Oil of turpentine is indicated as a stimulant to the genito-urinary tract in cases of amenorrhea, chronic pyelitis and cystitis.

Old oil of turpentine is often advised as an antidote for phosphorus poisoning, because it contains ozone and forms a harmless camphor-like body—turpentine phosphoric acid. Its use has, however, been found worthless by some investigators.

Contraindications: Turpentine should not be administered when there is nephritis, congestion of the kidneys, or acute inflammation of the gastro-intestinal tract. Care also should be exercised in giving large doses of the oil to patients when there is present a constipation or stoppage of the bowels. Care should be taken in its purchase, when intended for internal use, as the commercial grade often contains impurities and poisonous substances which, when administered to an animal, will produce poisoning.

If one so desires, the odor may be disguised by the addition of almost any volatile aromatic oil and the color can be changed by suspending a piece of alkanet root in the stock bottle.

A SPORADIC OUTBREAK IN CATTLE RESEMBLING TETANUS

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Introduction

During the past two years, the writers have been called upon to investigate the cause of serious losses among Ayrshire cattle on a farm located in the eastern part of the Province of Quebec. As far as could be ascertained, losses began in the year of 1918, and still continue. Among the early losses, there were seven adult animals and a number of calves. Lately, only animals under the age of three years have died, with a mortality as high as ninety-five (95) per cent. Once the symptoms appear, age has little to do with the prognosis of the case. Of the animals which have shown symptoms, only two have survived.

Records of the herd show that, in 1921, twelve animals were lost, and in 1922, sixteen. Previous years have shown about the same rate of mortality. The initial loss from the outbreak has been estimated at approximately $15,000. The potential losses would be even much greater, since the animals were pure-bred and free from tuberculosis.

The disease has persisted and has been confused with other diseases of a contagious and infectious nature. Clinical symptoms have indicated forage, arsenic and strychnine poisoning, blackleg, anthrax, tetanus, hemorrhagic septicemia, and "vibrion septique." Early in the outbreak, chemical and bacteriological examinations did not assist in determining the causative agent.

Clinical Symptoms

The onset of the disease in cattle is very insidious. No symptoms in acute cases are noticeable to the herdsman until about half an hour before death takes place. A typical picture is as follows:—Bleating, wild running about the stall, running into objects, circling always in the same direction, and eventually falling to the floor. The ears are erect, eyes (pupils) dilated, tongue protruded to one side of the mouth, slobbering, rapid, forced, or labored respiration. When down, the animal is unable to arise and the slightest noise excites convulsions. The head is drawn backward, the back arched, legs extended and twitching,

and can not be changed upon pressure. Increased convulsions are excited by rubbing the hair or by offering food. The animals are apparently blind.

The pulse is rapid, weak and almost imperceptible. The mucosae are congested and the extremities are cold. On auscultation the heart is found to be irregular, and the beat can be heard easily over any part of the thoracic cavity.

Respiration is dyspneic, shallow and very painful. A frothy, bloody, nasal discharge is observed in some cases.

In all cases a characteristic chain of symptoms is seen in the digestive system, namely:—Anorexia, cessation of the peristalsis, tucked-up appearance of the abdomen, diarrhea, and the drooling of a thick, viscid, stringy saliva. In the early stages there is a constant champing of the jaws, which gives the animal the appearance of yawning. As the disease progresses the jaws become set. The temperature remains normal throughout the condition.

Fig. 1. Shows progressive clinical symptoms exhibited by cattle infected with the disease produced by this organism. Note elevation of head, ears erect, wild look, hair coat, as observed in early stages of the disease.

Animals die in the position assumed before death. Death under these conditions indicates a comatose condition. Animals sick for a very short time show greatly increased nervous reflexes. Where recovery follows, the animals show a chronic debilitated condition, atrophy of the muscles, and nervous disturbances not unlike chorea.

Gross Pathology

Carcasses do not exhibit any peculiar external or characteristic conditions. A frothy, bloody, nasal discharge, a drooling of a thick, viscid, stringy saliva, and a bloody diarrhea are often observed.

In the abdominal cavity, a sero-hemorrhagic exudate is found, together with certain changes in the parenchyma. There is a sloughing of the mucous membrane of the small intestine, a hemorrhagic and degenerative condition of the liver, spleen and kidneys. The bladder is distended. Submucous, subserous and subcutaneous hemorrhages are seen.

The thoracic cavity also contains a sero-hemorrhagic exudate. The lungs show varying stages of inflammation from congestion to consolidation. The heart exhibits a marked degeneration of the myocardium and is devoid of blood.

The brain and meninges are congested and surrounded by an exudate of a sero-hemorrhagic nature.

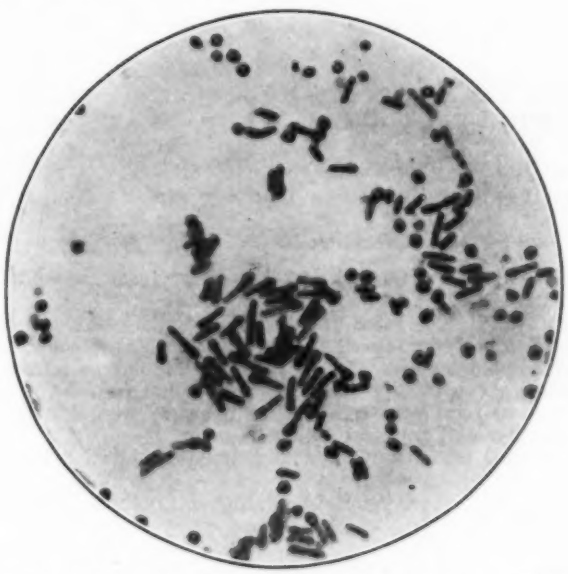

Fig. 2. *B. suberis* from agar culture, 24 hours at 37°C. Stained by Gram. x 1200.

Isolation of the Organism

An organism showing the characters hereafter described, and provisionally named *Bacillus suberis* (because of the fact that it is commonly found in cork), has been isolated from wounds made by a punch, used in ear-tagging; from navels; and from the inter-

nal organs of calves dead with the disease. It has also been isolated from cork-brick stable-flooring, unused cork-brick, granulated cork used in the manufacture of the cork-brick, cork dust used in the packing of grapes, insulating cork, and from soil of the farm.

Description of Bacillus Suberis

In 24-hour cultures at 37°C, inoculated from the diseased animal tissue, diplococcus forms are found, 48-hour broth cultures show bipolar forms when stained with methylene blue, 72-hour cultures exhibit the presence of bacilli with terminal spores resembling tetanus. Sub-cultures on agar show spore formation and bipolar forms in 24 to 36 hours. The bacilli have rounded ends and seldom unite in pairs or chains. In 12- to 18-hour, broth cultures the bipolar forms appear, but were observed best in milk cultures 5 to 7 day old at 37°C. With methylene blue the organism does not stain deeply but at one or both poles and sometimes in the centre of each rod metachromatic granules are found which take a reddish or purplish tint. Jordan and Harris[1], in a paper on Milk Sickness, report an organism with similar reddish granules. 24- to 36-hour agar slopes at 37°C show vegetative cells from 0.5 μ to 1.0 μ in width and average 4.5 μ in length. The organism is motile with peritrichous flagella, Gram-negative, aerobic and facultative anaerobic.

Cultural Characteristics

B. P. agar slope at 37°C. Growth in 24 hours is rapid, spreading, glistening, of a dirty grey color.

B. P. agar plate at 37°C. (a) Surface colonies in 24 hours are spreading, irregular, smooth, flat, contoured and greyish to white in color.

(b) Surface colonies of a second type are circular to ameboid, smooth, slightly raised, greyish white. Colonies in 24 hours are 2-3 mm. in diameter.

(c) Under low power the second type is entire, irregular, dark-centered, coarsely granular and greyish to white in color.

(d) Submerged colonies are ameboid, flocose, greyish to white in color, and up to 1 mm. in diameter.

B. P. broth at 37°C. In 24 hours, clouding, no pellicle, heavy precipitate; clearing in 72 hours.

B. P. gelatin stick at 20°C. Faint, filiform growth on deep line of puncture. Distinct cup or funnel liquefaction in 4 days.

B. P. gelatin plate at 20°C. Glistening, entire, waxy, surface colonies, of 0.5 to 1 mm. in diameter, appear after 72 hours. Submerged colonies are smaller, and about 0.5 mm. in diameter, yellowish and yeast-like in growth. Under low power these are entire, conglomerate, finely granular and yellowish in color. In 6 days the liquefaction of surface colonies is cup-shaped, with a distinct centre and a concentric ring. Average size, 4 to 5 mm.

Dunham's solution at 37°C. Heavy pellicle, medium clear, pellicle falls with slight disturbance and reforms.

Dunham's solution, at 37°C, with the addition of 1% of saccharose, lactose, maltose, dextrose and mannite and 1% of Andrade's indicator, is negative for acid and gas in 48 hours.

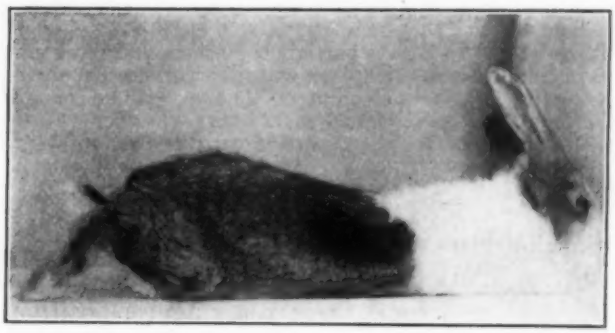

Fig. 3. Rabbit inoculated with the organism isolated from calf. Photo one hour before death. Note characteristic position assumed, ears erect, limbs extended, hair coat slightly ruffled.

Fig. 4. Rabbit inoculated with organism isolated from granulated cork. Photo twelve hours after death. Note symptoms as shown in Fig. 3.

Fig. 5. Rabbit inoculated with the organism isolated from cork-brick. Photo one-half hour before death. Note the symptoms previously mentioned.

Dunham's solution at 37°C gives positive indol with the Ehrlich test in 72 hours.
Plain milk at 37°C. In 6 days partial coagulation; in 7 days partial coagulation and digestion.
Litmus milk at 37°C. In 6 days partial coagulation and reduction of litmus; in 8 days reduction almost complete, with partial digestion and coagulation.
Nitrate broth at 37°C. Slight clouding in 72 hours, with no change to nitrites.
Cohn's solution at 37°C. No change in 72 hours.
Potato at 37°C. Moderate, raised, spreading, dirty yellowish growth in 24 hours.

Agglutination Tests

Agglutination tests of the serum of a recovered heifer gave a positive test in dilutions up to 1 : 320. In the case of an adult bull which recovered some three years ago, a positive test was furnished in dilutions up to 1 : 80. Preliminary tests indicate the presence of agglutinins in the blood of recovered animals.

Experiment Animals

Experiment rabbits, dogs, cats and guinea pigs inoculated with the organism previously described, exhibit the typical symptoms observed in cattle. Autopsy findings were identical with those of cattle dead with the disease. The organism has been recovered from the body tissues, and the site of inoculation in all experimental autopsies. Reinoculation with *B. suberis* isolated from experiment animals also proved pathogenic.

Figures 3, 4 and 5 show typical symptoms exhibited in experiment rabbits, by inoculations with 48-hour cultures of the organism.

Histo-pathology

The conditions are as follows:—

1. Acute hemorrhagic and degenerative meningitis.
2. Acute sero-hemorrhagic and degenerative myocarditis.
3. Acute sero-hemorrhagic and degenerative hepatitis.
4. Acute hemorrhagic and degenerative splenitis.
5. Acute sero-hemorrhagic and degenerative nephritis.
6. Acute hemorrhagic and diphtheritic enteritis.
7. Local lesion, when located, exhibits a purulent and necrotic condition, with a proliferation of tissue.

Differential Diagnosis

The disease has been confused with and diagnosed by local veterinarians as tetanus, forage poisoning, metallic poisoning, blackleg, anthrax, hemorrhagic septicemia, and "vibrion septique." In addition to the above-named diseases there appears to be a similarity between this disease and milk sickness.

While the ante- and post-mortem symptoms may be similar, in some respects, to each of the above diseases, differentiation is possible. The following means of differentiation may be used:—temperature, blindness, lack of crepitating and emphysematous areas over the local lesion, a study of the parenchyma by histo-pathological means and by bacteriological examinations.

Pathogenicity

The organism is pathogenic for cattle, pigs, rabbits, dogs, cats and guinea pigs. On the farm where the disease existed, two animals are known to have recovered. With experiment rabbits, clinical symptoms are always apparent with inoculation experiments, but in some cases death did not result.

Review of the Literature

In an exhaustive review of the literature, the authors have failed to find any organism described which conforms in detail to the one under study. Whilst somewhat similar organisms are recorded in the literature, minor differences in morphology and cultural characteristics separate this organism from those described.

Organisms showing the greatest similarity are *B. tetani* and the pseudo-tetanus group. Our organism differs, however, from *B. tetani* in staining properties, cultural characteristics and oxygen requirements[1]. The pseudo-tetanus forms described by Bain[2], Neide[3], Bienstock[4], Wright[5], Flügge[6] and others, are for the most part non-pathogenic, and their morphological and cultural characteristics differ from those of our microbe.

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Synthetic Milk Perhaps

A little girl from the city had been visiting in the country, and was being questioned as to what kind of time she had. Finally some one said, "I bet you don't even know how to milk a cow."

"Bet I do," she said.

She was pressed for particulars, and explained, "You take the cow into the barn and give her some breakfast food and water and then you drain her crankcase."—*Prairie Farmer.*

FAT NECROSIS IN COWS AND ITS RELATION TO THE DIAGNOSIS AND TREATMENT OF STERILITY[1]

By Dr. C. J. Marshall, *School of Veterinary Medicine, University of Pennsylvania.*

During the past two years of Ambulatory Clinic work in herds near Philadelphia, fat necrosis has been diagnosed in five dairy cows. It is not the purpose of this paper to discuss the pathology of fat necrosis, lipoma, obesity, etc. Those who are interested in this part of the subject are referred to an article by Dr. W. A. Hagan, which appeared in the Journal of the American Veterinary Medical Association, September 1921, and to standard text-books on pathology.

Judging from experience, conversation, and correspondence with veterinarians who are engaged in Federal Meat Inspection and those who are working with breeding problems in dairy herds, fat necrosis has been recognized in general practice but a short time, yet a number of interesting cases have been encountered. Men engaged in Federal Meat Inspection say that it is not rare in cattle slaughtered for beef. It appears most common in animals that have received good care and are in prime physical condition.

In discussing the causes of fat necrosis, Wells states that practically all cases are produced by the action of the pancreatic juice upon fat tissue, presumably through the action of enzymes it contains, and that the condition can be produced experimentally by any procedure that causes the escape of the pancreatic juice from its natural channels. He further states that in human pathology it has followed trauma and acute infection of the gland and the blocking of the ampulla of Vater by gall-stones, which permits the bile to back up into the pancreatic duct, where it produces an acute inflammation of the pancreas. His experiments showed that lesions of fat necrosis may be produced in three to five hours large enough to be visible to the naked eye. Healing follows rapidly in cases of recovery; the foci may disappear as early as eleven days after their formation. The condition is said to occur most often in dogs and hogs. It has been seen in sheep and horses.

Necrotic fat appears much like suet, hard, irregular in shape

[1]Presented at the fortieth annual meeting of the Pennsylvania State Veterinary Medical Association, held at Harrisburg, Pa., Jan. 23 and 24, 1923.

and varying in size. In a case that came under our observation, one mass weighed thirty pounds. When palpated through the rectum small lumps feel somewhat like a firm ovary, a tuberculous mesenteric gland, or a cotyledon. In most cases necrotic masses of fat are located only in the abdominal cavity and principally in the mesentery.

Hagan reports that in one case examined by him a fatty mass had surrounded a loop of bowel and stopped peristaltic action. In one of our cases a similar condition was present.

Fat necrosis might easily be confused with tuberculosis by rectal palpation, or even at autopsy. We felt justified in eliminating tuberculosis for the reason that our cases all appeared in officially accredited herds.

Our first experience with fat necrosis occurred January 5, 1921. The subject was a purebred Ayrshire cow, seven years old and in good physical condition. The herd-book history showed that this animal had dropped healthy calves January 1917, March 1918, May 1919, and was last bred March 11, 1920. Regular estral periods occurred after that service. On November 1, 1920, an examination for pregnancy was made by a private practitioner. He diagnosed a mummified calf and invited the Ambulatory Clinic to see the case and assist in removing the mummy. We made an examination two months later. A hard mass could be palpated over the anterior border of the pelvis as large as a six-months fetus and occupying about the same position as a normal pregnancy. The mass was irregular in shape. It appeared like the head and one leg of a fetus. The uterus could not be retracted and neither ovary was located. We had no hesitancy in confirming the diagnosis. It was arranged to attempt to remove it on February 1, 1921.

The private practitioner, the Ambulatory Clinic, and a veterinarian, who was doing special work on the diseases of the reproductive organs of cattle, were present at the time of the operation. All examined the case and were satisfied with the diagnosis. It was decided that a laparotomy would be necessary. The animal was given a drench of six ounces of alcohol diluted in an equal quantity of water. The narcotic effect was excellent. The operation was performed in the usual manner with the animal in the standing position. The mass of fat was located where the mummy was supposed to be. It was too large to be removed through the laparotomy opening. The animal was then slaughtered for beef. Many fat tumors were found in various

parts of the abdominal cavity. The one that had caused the trouble surrounded the horns of the uterus and completely covered them as well as the ovaries. The mass weighed thirty pounds, was irregular in shape and somewhat resembled a six-and-a-half-months-old fetus when palpated through the rectal and uterine walls. The pancreas was not examined. The tumor was brought to the laboratory and a diagnosis of fat necrosis was made.

The diagnosis was made on two other cows in this herd during the following year. These animals would not breed and were sent to the slaughter house. No autopsy was made on them. The tumors were smaller than in the previous case and several instead of one could be palpated *per rectum*.

The fourth case was diagnosed in a pure-bred Guernsey cow, which is breeding regularly but aborted the last calf. The tumors were found during the examination and treatment that followed the abortion. The tumors were not larger than a walnut but several of them could be palpated in the region of the uterus.

The fifth case was in a pure-bred Guernsey with a somewhat interesting history. This cow was born June 27, 1916, and dropped a normal calf March 9, 1919. On February 17, 1920, a monstrosity was removed with considerable difficulty. Six treatments were given for the lacerations caused by the delivery. The cow was pronounced cured and ready for service April 8, 1920. A normal calf was dropped February 3, 1921, and a dead one March 17, 1922. We were asked to examine this animal again April 20, 1922, for udder trouble and a case of catarrhal mastitis was found. The milk had slugs in it for a time but recovery soon followed. On the same date a rectal examination was made and fat necrosis was diagnosed. There were several masses within reach. The largest was located in the left pelvic region near the cervix. It was estimated to be three inches long, two inches wide, and about one inch in thickness.

The next examination was made November 2, 1922 and the animal was found open. The largest lump had nearly doubled in size. An examination was made again on November 14th by two experienced veterinarians in consultation with our Clinic. All agreed that the condition was fat necrosis, but the genital organs were normal and it was decided to breed the cow the first estrum. This animal had made the advanced registry in milk production. For this reason and on account of the good blood lines progeny was much desired. Estrum soon followed.

Service was given, and the animal being nearly dry was sent to the dry-stock barn.

During the holiday vacation this beast was taken sick with what appeared to be an obstruction of the bowel. The local veterinarian was called and treatment according to his direction was followed for ten days when death occurred. Unfortunately a veterinarian was not present at the autopsy. The abdominal cavity was opened by an intelligent layman who reported that many fat tumors were found in the abdominal cavity and that to him they had much the appearance of suet. One mass of fat had surrounded a loop of intestine and closed the lumen so the contents could not pass it.

If the diagnosis of fat necrosis was correct in this case one might wonder whether the pancreas might have been injured in delivering the monstrosity two years previous to the discovery of the condition and if so would it have shown evidence of the injury at the time of death.

Where this condition is suspected the animal should be kept under observation, a careful autopsy conducted and especial attention given to the pancreas. It would be interesting also to know whether cases of fat necrosis might make a spontaneous recovery. Our diagnosis in none of these cases except the first was confirmed by autopsy findings and the pancreas was not examined in this one.

The diagnosis of fat necrosis might properly be questioned in the last four cases yet we feel that it is correct. A properly conducted autopsy would be the only method for settling the question correctly.

You Can't Fool Your Wife

A certain sportsman went out for a day's rough shooting. He was not a particularly good shot, and so he got nothing; but since he was rather ashamed to return empty-handed, he bought a hare in the town on his way home.

He presented the hare to his wife, who, after responding with the usual congratulations, thoughtfully remarked:

"Do you know, it was a good thing you shot that hare when you did, John; it wouldn't have kept another day."—*Youth's Companion.*

PERIODIC OPHTHALMIA

By A. SAVAGE

Agricultural College, Winnipeg, Man.

The amount of attention which Canadian veterinarians in the B. E. F. were called upon to give to "specific" ophthalmia is the writer's chief excuse for reviewing an affection that happily is of no great economic importance in this country. And if in addition to refreshing the interest of former officers the following remarks will help modify the conceptions of the disease held by those practitioners who have not seen it in a position of serious prominence, he will feel somewhat justified in committing them to paper.

Unfortunately, the names of the disease are misleading. It is not necessarily periodic, neither has it any connection with the moon; its specificity has never been proved, and it does not invariably terminate in blindness. Moreover, blindness is a condition, not a disease. The word "ophthalmia" has reference to the eye, but is objectionable in these days of precise diagnosis because the eye, like most other parts, contains several distinct structures. Uveitis is more nearly correct, while the terms cyclitis, iritis and choroiditis, used singly or in combination, express the real state of affairs. To the objection that these names are without etiological significance, is the reply that so are most of the cases one meets.

In its occurrence the disease makes no discrimination between sexes, and it may appear in any stage from birth to senility. The lymphatic type of horse is considered by many to be more susceptible than the clean-legged, fine-boned breeds. Statistics do not show that season has much influence, but rather that affections of this sort are fairly evenly distributed throughout the year.

Geographically, however, its occurrence is different. Most literature on the subject accuses the low lands of Flanders and Northern France of being veritable hot-beds of ophthalmia, and exempts the higher altitudes. Certainly irido-cyclitis seemed exceedingly common among the horses of the B. E. F. in these countries. Statistics when published, however, will not afford a suitable collection of animals elsewhere for comparison, nor will they mention that for the compilation of Army Returns by

officers in the field "specific ophthalmia" was usually synonymous with "something wrong with the eye."

The causes are many. Inflammation of the uveal tract has been observed following blows on the ocular globe; it occurs commonly enough as a complication of or sequel to contagious pleuro-pneumonia and other severe septic conditions; and it may appear as a primary and separate affection.

It is concerning the etiology of primary uveitis that so many theories have been advanced. The writer has known otherwise serious-minded veterinarians to accuse everything in connection with horse management, except grooming and shoeing, of bringing about the disease. Water, feed, air and exercise, heredity, various parasites and infection have all been regarded with suspicion, but as none of them except the last can be practically dispensed with, they deserve no comment.

Is the Disease Infectious?

The infection theory is a popular one. Various micro-organisms and parasites have been found in the eye by different investigators. None of them, however, typically reproduced the disease. Quite recently Dalling[1] published an account of a bacillus isolated from the optic nerves of affected horses which he thought "if not the actual cause of specific ophthalmia, was at least one of the causes, probably acting with others." His work has not been confirmed.

On the contrary, Knowles[2], using strains of the bacilli isolated by Dalling, concludes: "It is therefore difficult to reconcile the findings of Dalling with the observations recorded here, firstly, because in the latter no growth of the 'nerve bacillus' or any other bacillus was obtained from the optic nerve in typical cases of recurrent ophthalmia, and, secondly, because no specific agglutinin for the 'nerve bacillus' was present in the serum of the cases examined."

The old dogma of Rolland[3], that the disease is fundamentally rheumatoid and due to Klebs' organism, is a difficult one to disprove, especially in so far as the first statement is concerned. Nicholas[4] dismisses the subject by saying, "Though brought up from all sides, the contagion theory seems hardly admissible. In any case we do not possess a single document worthy of establishing it."

The onset is usually rather sudden and may in some cases be accompanied by distinct systemic disturbances. Unfortunately those local symptoms that would otherwise be revealed through

the ophthalmoscope, are often masked by a diffuse keratitis, which renders examinations of the internal parts of the eye impossible.

Lachrymation, edema of the lids, photophobia and pain, as expressed by resentment at having the part examined, are usually present. In severe cases the head may be lowered or even held on one side. Pericorneal injection, a symptom to which much importance is attached by some, is not invariably present, nor is it easily detected in certain eyes. In cases involving the posterior parts of the uveal tract it may be absent.

Iritis, or irido-cyclitis, as manifested by a discolored iris, and probably in the course of time a collection of pus in the bottom of the anterior chamber (hypopyon), together with the formation of synechiae which may not be recognized until afterwards, constitute the commonest form of the disease.

Structures Involved

Rolland[3] dogmatized that the disease in question was an iritis and nothing more, and that the formations of adhesions between the iris and the lens capsule was inevitable. Conversely he held that the detection of synechiae in otherwise healthy eyes "gives one the right to affirm with entire certitude that the eye is affected.."

The inflammatory process, however, need not be limited to the anterior parts of the uveal tract, nor conversely is there any valid reason why the choroid cannot pass through the various stages of acute inflammation without involving the iris. A severe exudative choroiditis may detach the retina, leaving it floating in a pathologically changed vitreous. Pressure resulting from the same condition, if confined to the back of the eye, because of a complete posterior synechia, sometimes causes a pressure paralysis of the retina without actually displacing it. Such a condition is often referred to as amaurosis or "pop-eye," when the acute stages have passed.

Between the iris and the choroid lies the ciliary body which, as a matter of clinical observation, is generally involved both in cases of iritis and choroiditis. The most serious, direct effect of cyclitis is to detach the suspensory ligament of the lens, allowing that medium to fall free or nearly so into the fundus of the eye, or to be pushed forward against the cornea by pressure in the vitreous.

Needless to say, inflammation of the various parts of the tract

may occur in different combinations and degrees of severity. In some cases the exudative stage is hardly reached, the eye recovering from such attacks with little or no permanent change. In others the entire vascular coat is involved, the inflammation severe, the exudate abundant, and the eye rendered permanently useless by one attack of panophthalmitis.

The course is naturally varied, both in its duration and in the complications which may ensue. Average cases clear up in approximately a week or ten days.

Among the sequelae of anterior uveitis are various forms of corneal opacities, anterior synechiae (resulting from organization of a hypopyon), partial and complete occlusion of the pupil, posterior synechiae and cataract.

There seems to be a certain concurrence of cataract and posterior synechia. Rolland stated that the latter of these always eventually provoked the former. The writer, examining 130 eyes affected with cataract, found 107 of them with posterior synechiae. On the other hand, he has observed many slight synechiae, the kind that break down under atropine, leaving only a shadowy spot on the lens capsule, and which in the course of many months of observation showed no sign of inducing cataract—either capsular or otherwise.

Recurrences

Concerning the recurrence of the disease, it is dangerous to say much. The writer knew one animal that developed an iritis in one eye only, but accompanied by constitutional disturbances, approximately once a year for three years; he eventually went blind from cataract. As an example of the opposite type, he had a saddle mare for his own use that became affected in each eye alternately at regular intervals of one month. (As she was invariably in oestrum at the time of these attacks, her usefulness can be imagined. To say the least, her behavior was unladylike).

On this point Nicholas writes, "When we say that iridocyclitis from any cause and in any species is recurrent, it shall be the reason for which we accept neither the qualification "periodic"—which is inconvenient because it hints at a fixed period of time between attacks—nor that of 'recurrent' which to be more realistic, is not on that account any more exact."

The prognosis varies with nearly every case, depending upon the number of previous attacks, and the extent and severity of

the one under observation. Considering the probability of recurrence and the eventual formation of cataract, or other lesion leading to loss of vision, it is always sufficiently grave for the eye concerned. Sympathetic affection of the other eye, which sometimes follows iritis in humans, it not to be feared in the domestic animals.

In treatment a certain discrimination can be used. Obviously a first attack in a valuable animal calls for different procedure than one would adopt towards a scrub beast affected for the tenth time or a horse convalescent from pleuro-pneumonia.

On general principles the animal should be put at rest. Failing that, the eye may be rested by covering it with a suitable pad so as to exclude light. For the purpose of endeavoring to eliminate the cause, hydrogogue cathartics, diuretics and alteratives are indicated. Of the last class of agents, potassium iodide given *per os*, in progressive quantities of from 20 to 40 grams per day, was recommended by Dor in 1900. Other writers have not altogether agreed on its merits.

As revulsants, cupping, bleeding and blistering have been employed in the temporal and periorbital regions. An improvement in the application of this princple is probably the basic reason for Wigg's[5] treatment, which consists of injecting 1 cc Lugol's solution deep into the orbital fat and repeating, if necessary, in about a week, or when the reactionary swelling has subsided.

Local Treatment

Concerning the eye itself, there are a number of useful medicines, outstandingly atropine and cocaine. The former of these, by paralyzing accommodation and dilating the pupil, prevents the formation of posterior synechiae. It also reduces intraocular pressure, diminishes hyperemia of the iris and ciliary body and puts the parts in question at rest. Cocaine, while not so mydriatic, has the additional merit of being a local anaesthetic. An easy and satisfactory means of application consists in using an ointment of 1% atropine hydrochloride and 1% or 2% cocaine hydrochloride, in a base of white vaseline. This applied under the lids once daily, in quantities about the size of a pea, exerts a continuous effect and saves the annoyance of repeated aqueous instillations.

Adrenalin is also indicated, and may be used in "drops" along with atropine and cocaine, the usual form in which it is

marketed not being miscible with fats. Mollereau, Porcher and Nicholas[6] give the following prescription and advise covering the eye with a pack soaked with 3% aqueous solution of potassium iodide.

Cocaine hydrochloride	2.0
Potassium iodide	2.5
Glycerine	16.0
Distilled water	100.0

A few drops to be instilled into the eye morning and evening. (The cocaine may be omitted when hyperesthesia is no longer present.)

In the absence of an attack, demonstration beyond controversy that any particular eye has or has not been affected with some form of uveitis, is not always possible, though in many cases if a suitable examination is conducted, one can find permanent changes of structure. The point is of legal value under many conditions. Many of the states in the U. S. A. have legislation prohibiting the importation for breeding purposes of stallions affected with periodic ophthalmia "in any form," amaurosis and cataract. In France the disease is a *vice redhibitoire;* its appearance in a horse within 30 days after sale renders the transaction legally void.

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WAR'S ANIMAL VICTIMS

Westminister City Council, London, England, have sanctioned a proposal for the erection of a memorial in Hyde Park to all the animals that lost their lives in the war. More than £2,000 have been collected for the purpose by the Royal Society for the Prevention of Cruelty to Animals.

The animals to be commemorated range from mice and small birds used in the detection of poison gases to the elephants that were killed while on heavy transport duty.

There were 364,130 British horse casualties in the war. Dogs engaged for various purposes died in thousands. *Canadian Veterinary Record.*

REDUCTION OF TORSION OF THE UTERUS[1]

By JOSEPH W. VANSANT, *Fox Chase, Pa.*

During twenty years in general practice, largely devoted to cattle work, I have developed a great interest in cases of dystocia. For years, I dreaded to find upon examination of a cow in labor that I had a case of torsion of the uterus with which to deal. In such cases, although I never failed to turn the uterus eventually, I was unable to tell what part of my long hard tedious work was accountable for the results. This prevented me from gaining confidence in myself from previous experience to handle the condition. Several years ago, therefore, I decided to operate on one of these cases and successfully reduced the torsion by manual manipulation inside the abdominal cavity. Since this time, I have operated on a number of cows and one large sow with very satisfactory results.

My method of procedure in such cases is to make a vaginal examination and ascertain the extent and direction of the torsion. In case the cow has not been eating well for a few days and shows a somewhat empty gastro-intestinal tract, I proceed to operate at once. When the rumen is quite full and especially if the cow is very fat, I order her starved out and given Glauber's salts in one-half to three-fourth pound doses every three to four hours until the stomach and intestines are well emptied before the operation is started. While operating, it is preferable to leave the cow standing in the stanchion with a nose leader in her nose if this is necessary. The skin on the left side just posterior and superior to the point where the trochar is inserted in performing rumenotomy is clipped or shaved and washed. An incision is then made through the skin downwards and forwards about four inches long or large enough to admit the hand and arm. The index finger is used to separate the muscles in the direction of their fibers and the peritoneum is punctured with a knife in case any difficulty is experienced in pushing the finger through it into the peritoneal cavity. The right hand and arm are now thoroughly washed and may be rubbed with carbolized vaseline and introduced through the incision into the abdominal cavity. An examination is first made of the position of the calf and condition of the uterine walls. Great care must be used during manipulation not to push the fingers through the uterus. This is avoided

[1]Reprinted from Univ. of Penna. Veterinary Extension Quarterly, No. 3.

by working with the flat of the hand pressed against the calf at a point where the hand can make an indentation against the fetus, forming a ledge. In cases where the uterus feels like a round ball and its walls are swollen and oedematous so that the calf can not be definitely outlined there is particular danger of puncturing it during manipulation. It may also be difficult to turn in this condition on account of the hand slipping over the smooth surface when rotation is attempted. Under such conditions considerable help may be obtained from two assistants with a strong piece of wood about six feet long and two to four inches wide.

To illustrate the use of such assistants, let us consider that we are dealing with a uterus pregnant in the left horn, which has undergone a full turn so that the left horn has revolved completely around to its original position on the left side. To replace it, the left horn must be pushed down across the abdomen and brought up on the right side and back into place. It can readily be pushed down and across, but the operator cannot reach far enough to keep the hand under it and raise it. By removing the hand to get into another position from which to lift, we lose what has already been gained on account of only having one hand with which to work. Therefore, when we have pushed the horn down and across we have the assistants one on each side of the animal with the board passed under the abdomen. The man on the side with the operator (left side) raises his end of the board, pressed firmly against the animal, then he will lower his end as the man on the opposite side raises, keeping very firm pressure against the abdomen. This will let the operator get his hand under the uterus again and also materially help to raise it up and over into place. When the torsion is reduced, the peritoneum and muscles are sutured with uninterrupted catgut sutures. The skin incision is sutured separately with strong thread. In case the uterine walls are thickened and the *os uteri* is not well dilated, it is better to wait for twenty-four hours before attempting to deliver the calf, otherwise, we may proceed with delivery at once. Thickened uterine walls are liable to rupture when traction is applied in removing the calf. When delivery immediately follows the operation, it is well for an assistant to hold a cloth moistened with disinfectant over the incision to prevent air from passing in and out of the abdomen during the contractions and relaxations of labor.

The majority of these cases can be replaced in about five

minutes after the hand is inserted into the abdominal cavity and the position of the uterus ascertained. In one case, a complete turn was replaced in about one minute as it seemed to simply roll over like a ball. From my experience it seems to be the most logical method for practitioners to use in handling these cases.

ALUMNI DAY—VETERINARY SCHOOL UNIVERSITY OF PENNSYLVANIA JUNE 16, 1923

Come all ye loyal Penn men now
From practice, lab and clinic.
Lay down your work and worries for
The royal Red and Blue
Dean Kleinie has his coat off
Old C. J. is ready too.
All for a good, old, care-free time
Come back on Alumni Day!

(Apologies to "*The Red and Blue*")

It is agreed that the above is pretty bad but the point is that every Penn man who fails to heed the call will regret it as long as he lives.

Alumni Day, June 16th, 1923 is to be a day of jollification and a reunion in every sense of the word. Every man who has had veterinary problems bothering him and hoped to get some information, when he goes back to school on Alumni Day, can button-hole the man with whom he wants to talk "shop", but there will be no "shop" talks on the program.

The day will start with a short, snappy business meeting at 9.30 A. M., daylight saving time. Immediately following the business meeting the fun will begin. Come prepared to roll back the years and become a freshman once more.

After "doings" in the court-yard, lunch will be served, ample opportunity being given for classes and old cronies to get together.

Every man will want to see the new stadium. Tickets for the ball game will be provided. We will either take part in the Alumni Day Parade, or view it and the ball game, in a body.

Mark this day on your calendar—JUNE 16th,—and be on hand at the Veterinary School, University of Pennsylvania at 9.30 A. M., daylight saving time.

R. M. STALEY, *Secretary.*

WHY THE STATE VETERINARY DEPARTMENT DOES NOT RECOGNIZE THE RETEST OF REACTORS*

By J. G. FERNEYHOUGH, *State Veterinarian, Richmond, Virginia*

As far back as 1898, Nocard, one of the world's greatest authorities on bovine tuberculosis and the use of the tuberculin test, wrote the following: "The observation of a clear reaction to the tuberculin test is unequivocal; the animal is tuberculous." Nocard then goes on to say that it often requires prolonged and minute researches in the depths of all the tissues to discover the few miliary centers, the presence of which had been revealed. "The reaction is absolutely specific." The Bureau of Animal Industry, in one of its very recent official programs, had the following in large print. "DID YOU KNOW THAT ONCE A REACTOR ALWAYS TUBERCULOUS?"

Personally, I have been using tuberculin since the year 1896, when, as a student, I commenced work under the State Veterinarian who was at that time located at the State College, at Blacksburg, Va. In those days when tuberculin was just being introduced as a diagnostic agent, it was not an uncommon practice to hold reactors and submit them to a retest in from 60 to 90 days. However, it was soon observed that nothing but confusion, loss of time in the work, and the spread of tuberculosis would result in the practice of retesting reactors. Therefore, for these reasons, after I was appointed to take official charge of the work (over twenty years ago), I recommended that in Virginia we would not recognize the retesting of positive reactors. Because in this State, we are testing cattle to control and eradicate tuberculosis. While we love to advertise a man's herd as "free from tuberculosis," when we believe it to be free, yet the true results of the tuberculin test must clearly indicate that this is a fact, before it will be given a clean bill of health—it matters not who the owner happens to be, or what his opinion is. The responsibility of the work rests on the State Live Stock Sanitary Board and the State Veterinarian. Therefore, for the good of the work, we are going to be as careful as possible.

Let me cite you a case: An animal reacted, and then the owner, who I thought was keeping her in quarantine, had her retested. She passed the retest. She was a fine, registered Guernsey cow,

*Read before the annual meeting of the Virginia State Veterinary Medical Association, Richmond, Va., January 11, 1923.

and after keeping her several months, the owner was offered $1,000 for her. This man believed the cow to be healthy. He thought the men who marked her as a reactor had made a mistake. In order to ship her interstate, he had her tested again and she passed. Now follow me closely; this cow reacted, then passed two tests O. K., made by different veterinarians. The owner then told me what had happened, and said that my man had made a mistake in the first test. I considered the matter carefully, and then took the position that the first test was correct.

The animal had reacted, and I would not recognize the two tests which she had subsequently passed. The owner had sold her, and shipped her to South Carolina. I informed the purchaser that he had a reactor in his herd. This new owner then had the U. S. B. A. I test her again, with the subcutaneous test. This she passed. They then applied the intradermic test, and she passed again. I was still not satisfied and said: "No, she is a reactor." She was slaughtered and found to be tuberculous, and the disease was of long standing. The man who sold this cow thought he was right; the man who purchased her was satisfied until I called her a reactor. They are both gentlemen, and the one who sold her returned the purchase money, and he is today a good friend of mine, since he found I was right.

I dare say there are few veterinarians who have had any experience with the retesting of reactors, who have not been forced to the conclusion that after an animal once gives a positive reaction to the tuberculin test, she may in the future pass several tests, giving no sign of a reaction, although she is tuberculous. Just why this is true, I cannot say; nevertheless, knowing it to be a fact, I cannot pass animals as healthy after they have once reacted. To do so is unfair to the herd owner, if he does not know any more about the test than to want his reactors retested, and if he still desires to have them retested, after it has been explained to him that often reactors will pass subsequent tests, although the animals are tuberculous; then such a herd should be let alone by all honest veterinarians.

If a herd owner wishes to sell tubercular animals, let him take the chances, but do not allow him to put the responsibility on the veterinary profession. I notice that the man who wants his reactors retested never wishes to buy reactors from some one else. If these men do not believe in reactors, except when it suits them, we had better let them alone. Else, such men will

ruin our profession. In my opinion, no man should be persuaded to retest a positive reactor unless he desires to destroy his usefulness as a veterinarian in this State.

The conclusion of the matter of retesting reactors is this: We know they will often pass subsequent tests though they are tubercular. Therefore, as professional men, we are robbing the honest man when we retest his reactors, and take his money for the work. If we retest reactors for dishonest men, and pass them as healthy, we are at least subjecting ourselves and our profession to criticism which we deserve. We are retarding the control and eradication of tuberculosis by leaving tubercular animals in herds which are supposed to be healthy. When we retest reactors and pass them as healthy cattle, not only are we helping the owner sell his diseased cattle, as healthy ones, but what is worse, we are inviting the honest man who has cleaned his herd to go and buy from a herd in which there are reactors (TUBERCULAR CATTLE).

Retesting reactors and classing them as healthy when they pass the test, is, in my opinion, fraud on the part of the man who does not know what he is doing. Therefore, for the good of the country at large, it should not be done. "ONCE A REACTOR ALWAYS TUBERCULOUS."

Now, gentlemen, let me appeal to you as Virginia veterinarians. You have a reputation throughout the country for your honesty, as well as your professional ability. Let no man's money tempt you to retest his reactors. It matters not how prominent he may be socially, politically or otherwise, do not let him use you to pass his tuberculous animals. Remember gentlemen, when you are right you will have no cause to fear any man, or men. You are ABSOLUTELY RIGHT when you refuse to retest reactors for any man.

DOCTOR A. S. BURDICK HONORED

Doctor A. S. Burdick, President of The Abbott Laboratories, of Chicago, was elected President of the American Drug Manufacturers' Association at their recent meeting in New York.

The American Drug Manufacturers' Association is composed of the leading pharmaceutical manufacturers of America and the Association has for its object the improvement of conditions in the pharmaceutical field.

THE PRACTICAL VALUE OF POULTRY VACCINES AND REMEDIES*

By E. D. ENSIGN, *Bryan, Ohio*

The use of vaccines and bacterins in poultry practice at the present time seems to be somewhat limited. Many practitioners have paid little or no attention to chickens or their diseases. Consequently they are largely at sea in making a diagnosis and in prescribing treatment. In our practice during the last four or five years we have had a limited poultry business. Our results in some cases have been very pleasing; in others they have been very much the opposite.

Our experience has been principally with fowl cholera and roup. In fowl cholera the vaccine treatment as a whole has been very unsatisfactory, both as a cure and as a preventive. We vaccinated a number of flocks for cholera about two years ago. In two or three instances the results were very gratifying, but in most cases the treatment, if anything, increased the rapidity of death. However, medicinal treatment has proved much more satisfactory. We have used several drugs for this ailment, but bichloride of mercury, in drinking water or soft feed, or both, has given very good satisfaction. Sometimes all treatments seem to fail. In these cases it may be a disease other than fowl cholera, about which we know nothing.

For roup and chicken-pox the vaccine treatment usually gives very satisfactory results, both as a preventive and as a cure. However, in advanced cases, unless the birds are very valuable, we believe they should be destroyed, as the treatment of these usually extends over a long period of time (three to six weeks) and the average owner becomes disgusted and resigns, either killing the bird or allowing it to die from the disease and its complications. Where the infection is slight, or during the early stages, one treatment will many times clear it up; but usually the affected birds should have two or three treatments at three- to five-day intervals.

Medicinal treatment also seems to have a place in combating this disease; such as removing the cheese-like deposits and painting the lesions with some good antiseptic. The administration of intestinal antiseptics in the drinking water or soft feed is of

*Read before the annual meeting of the Northwestern Ohio Veterinary Medical Association, Toledo, Ohio, February 28, 1923.

some value, and here again we depend principally upon mercuric bichloride. Sanitation is very important in treating roup and we advise lots of fresh, dry, clean litter, plenty of fresh air, no drafts, and as much light and sunshine as possible.

Ptomaine poisoning is best treated by removing the cause, such as decomposed meat, etc. Coccidiosis we do not know much about, but thorough cleaning of the pens and moving the birds to clean, uninfected ground or grass seems to get good results. In tuberculosis there is no medicinal treatment, the remedy being to dispose of the entire flock, thoroughly clean up and disinfect. Then apply the tuberculin test to the cattle and maybe eliminate the source of infection.

From the standpoint of making money, poultry do not seem to be included in the veterinary practice law. They enter into practice as a side-line, from which you can only occasionally make a dollar. Some of our supposedly reliable and ethical veterinarians, from whom some of us have had considerable instruction, and by whom we have been taught many rules concerning professional ethics, seem to be perfectly willing to prepare poultry vaccines and furnish the same to laymen, with syringes, needles and full instructions for the administration of their products. Their representative goes out and vaccinates poultry for any one who calls upon them to do it and also serves as an instructor. The vaccine is furnished to the consumer at a price which is less than a veterinarian can buy it for, from a good, reputable, biological company. Naturally their results are not always satisfactory, and as a result the veterinarian occasionally gets a call. However, unless this condition of affairs can be overcome, the future of poultry practice for the veterinarian does not offer much encouragement.

A Good Symptom

"There's only one good thing about that young puppy that came to see you last night," said the angry father, "and that is he's healthy."

"I am surprised to hear you admit that much," replied the dutiful daughter.

"I wouldn't except for the fact that when you met him in the hall last night I heard you say—'Oh, George, how cold your nose is'."—*Judge*.

ON THE PROPHYLACTIC VALUE OF IODIZED TETANUS TOXIN[1]

KINMATSU OKUDA

(*From the Veterinary Laboratory, Ministry of Agriculture and Commerce, Nishigahara, Tokyo, Prof. N. Nitta, Director.*)

It is well known that animals may be protected from tetanus infection by the previous injection of tetanus antitoxin and the immunity thus produced lasts, however, only for a short time (a few weeks). To our regret there has been no safe and practicable method of inoculation against tetanus yet, which confers a long-lasting immunity on animals treated.

In the year 1917 Vallée and Bazy published a method of active immunization against tetanus. After demonstrating that injections of tetanus toxin attenuated by the addition of an iodine solution (iodine, 1; potassium iodide, 2; distilled water, 200) conferred a solid immunity on the rabbits treated, they treated 7 seriously wounded persons (who had received prophylactic injections of antitetanic serum) with the iodized tetanus toxin at the military hospital at Bégin; the patients received 3 subcutaneous injections at intervals of 5 days, 1 cc and 2 cc of a mixture containing 2 parts of toxin and 1 part of iodine solution, and finally 5 cc of a mixture of 3 parts toxin and 2 parts iodine solution. The French authors concluded that this method of injecting the iodized tetanus toxin is safe and confers a long-lasting immunity.

The writer carried out a series of experiments to ascertain the effect of Vallée and Brazy's method. To obtain the tetanus toxin the tetanus bacillus was grown aerobically in "liver-piece broth" with the addition of 10-20 percent fresh blood (the blood of cattle, horse or sheep is equally usable), and the lethal dose of the toxin thus obtained is usually 0,00001-0,000005 cc for a mouse of about 10 grams, 0,0001-0,00005 cc for a guinea pig of about 400 grams, and 0,001 cc for a rabbit of about 2000 grams. As the experimental animals used were a great number of guinea pigs and rabbits, and a few sheep, goats and horses.

The writer found that a mixture of tetanus toxin and iodine solution in proportion of 2:1, as proposed by Vallée and Bazy, is dangerous to guinea pigs and rabbits, the whole of the former (37) and a majority of the latter (7) developing tetanus, and

[1]Reprinted from the Journal of the Japanese Society of Veterinary Science, March, 1923.

mortality being about 60 and 43 percent respectively, while that in proportion of 1:1 is quite safe for both kinds of animals. Two injections of the mixture of 1:1 (1 and 2 cc) and third injection of that of 2.5:2 (4.5 cc) conferred a solid immunity on guinea pigs treated, which resisted the control inoculation of a lethal dose of the toxin, with no reaction.

It is much easier to immunize rabbits, one treatment being sufficient for this purpose, when used in a dose of 2-4.5 cc of a mixture of 1:1, 2.5:2, 2:1.5, 1.5:1 or 2.5:1.5.

In goats the immunity was produced by two injections of 2 cc of 1:1 and 4-4.5 cc of 2.5:2 or 2.5:1.5. Sheep and horses were also immunized by two injections of 5 cc of 1:1 and 8 cc of 2.5:1.5.

The iodized toxin retained its prophylactic value for about 40 days after being mixed with the iodine solution.

TRIALS WITH TUBERCULOSIS VACCINE

For years scientists have sought a way to reduce by means of a vaccine the ravages of tuberculosis. W. D. Frost (Agricultural Bacteriology) and assistants have made some progress by using tubercle bacilli, killed by means of ultra-violet light, as a vaccine, for which the name of *tubuvase* has been suggested. It was shown that the process of manufacture would kill the tubercle bacilli, rendering the method safe, also that the vaccine had considerable preventive properties.

Inasmuch as the proper dosage of *tubuvase* is not known, Mr. Frost proposes to continue the experiment by using much larger quantities of the vaccine. Recent experiments indicate that more than one hundred times the former maximum dose may be given with perfect safety.

When it is considered that from 25 to 30 percent of the hogs killed in this state are tuberculous and that most other farm animals are more or less subject to it, any disease resistance which could be built up in the bodies of the little pigs by means of *tubuvase* would be of great economic importance to Wisconsin, and it seems desirable to continue this work with the hope of reaching the goal which science has so long sought. *Bulletin 352, Wisconsin Agricultural Experiment Station, February, 1923.*

A SIMPLE METHOD OF HANDLING PROLAPSE OF THE RECTUM IN HOGS[1]

By J. E. SEVERIN, *Athens, Ga.*

The method is not original with us, but gives such uniform results and is so easy to use that we are constrained to urge others to try it. It consists of ligating the protruding rectum with a strong cord on a section of metal tubing. Metal tubing is used in order that the lumen of the gut can be kept open so that defecation may continue in a normal manner.

We made our first tube from a two-inch section of a large cork borer one-half inch in diameter. On the outside of each end of this cylinder was soldered a wire ring. These rings were placed about the tube in the same manner as a hoop is placed at each end of a barrel. They serve to hold the tube in place and to keep the ligature from slipping. Later we found that common garden-hose menders, which are nothing more than small corrugated brass cylinders, worked just as well.

To apply the tube, lay the hog on its back or restrain in any other convenient manner. Put traction on the everted gut until sound tissue is exposed and insert the tube until about half of it is within the anus. Then with a strong cord ligate the gut close up to the anus *as tightly as possible*, being sure that the bowel is securely caught between the encircling ligature on the outside and the hollow tube placed in its lumen. The ligated portion should change color in a few moments from a livid red to a dark blue if the ligature is placed properly. In some cases the ligature may have to be readjusted or tightened in a day or two. The isolated stump of the rectum sloughs off in five or six days with little local reaction.

It is important that constipation be relieved, before resorting to this procedure and it is advisable to feed sloppy feed, in which liberal doses of mineral oil have been incorporated, in order to facilitate the passage of feces.

The operation is effective, bloodless, can be performed in a few moments without anesthesia and causes only temporary inconvenience to the patient.

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[1]Reprinted from The O. S. U. Veterinary Alumni Quarterly.

CLINICAL AND CASE REPORTS

(Practitioners and others are invited to contribute to this department reports of unusual and interesting cases which may be helpful to others in the profession.)

TUBERCULOSIS IN A HORSE

By R. L. CONKLIN, *Veterinary Department, Macdonald College, Quebec*

On March tenth, the writer was called upon to perform an autopsy upon a horse which had died suddenly while at work. The animal was an aged gelding, weighing about 1250 pounds, of draft type and used for slow, farm labor. It was known that the animal had suffered with 'heaves' for two years. This animal and the other horses kept on the farm were housed in the cow stable with reacting cattle.

As far as could be ascertained from the driver, the animal did not exhibit any symptoms of illness previous to death. The animal was being used in the field when it suddenly dropped to its knees, groaned, protruded its tongue, which had lost its color, quivvered and died.

Autopsy:—The animal was in very good condition. There was no evidence of struggling previous to death. The hair coat was dry and well kept. The tongue was protruded and pale. It was observed that the mucosae of the lips, eyes and about the nose were pale. From the history and the condition of the mucosae, it was suspected that the animal had died from internal hemorrhage.

The following observations were made upon opening the abdominal cavity:—Little gas present in the intestines, absence of blood in the mesenteric vessels, liver was greatly enlarged and covered with purulent and caseous areas, 1 c.m. to 5 c.m. in diameter, the left kidney was nearly twice the size of the right, and upon incising it a calculus of the shape of a jack-stone was found in the hilus, the cortex containing many small caseated areas. The other organs appeared to be normal.

When the diaphragm was perforated a great quantity of blood poured through the incision. The left lung was found to have been ruptured from its anterior to posterior extremity along the dorsal portion. Both lungs contained numerous caseated and

small purulent areas up to 2 inches in diameter. The pericardium was thickened and the heart hypertrophied. The weight of the heart alone was found to be 16 pounds.

Sections of the liver, kidney and lungs were brought to the laboratory for examination. Results of the laboratory examination and sectioning of the tissues proved that the lesions were tubercular.

Death was due to internal hemorrhage from the ruptured lung.

This case is of much interest since it shows the susceptibility of some equines to tuberculosis, when they are exposed to the infection. This animal was no doubt a spreader, and would have been a source of great danger on a farm with an accredited herd.

The question also arises as to the relation of the tubercular trouble and the 'heaves'. Was this animal affected with emphysema or did the tuberculosis cause the symptoms to be exhibited. I am inclined to believe that the tuberculosis was indirectly the cause of the hypertrophy of the heart, and the direct cause of the symptoms of the 'heaves'.

ANESTHESIA IN THE DOG BY INTRAVENOUS INJECTION OF A MIXTURE OF ALCOHOL, CHLOROFORM AND PHYSIOLOGIC SALT SOLUTION

By HENRY CARDOT and HENRY LAUGIER

(Communication from the Laboratory of Physiology of the Biologic Research Institute of Sevres. Abstracted and translated by C. Nielsen.)

"Although the anesthetic effect of intravenous injections of alcohol, ether, or chloroform solution have been experimented with a number of times (Burkhardt, Hagemann, Grehant, Honan and Hassler, Sick) this method of anesthesia has never been introduced in general practice. The recent publications by Koshiro Nakagawa, in which is given a bibliographic resume of the question, have prompted us to describe a technic which we have used frequently in the dog and which has given satisfactory results.

"Series of experiments, which it will not be necessary to describe here, have finally lead us to employ the following solution:

Water	100.0 gm.
Sodium chloride	0.8 gm.
Chloroform	0.6 gm.
Alcohol, 95%	8.0 gm.

"Since it is preferable to diminish as much as possible the quantity of the solution injected intravenously, the animal is given an injection of 1 centigram (1.6 grain) of morphine hydrochloride per kg. one hour before the anesthetic is given, such as is the routine in many laboratories before chloroform anesthesia by inhalation (Dastre's method). In the morphinized dog an intravenous injection of 5 cc of the solution per kg. of the animal produces in an extremely rapid manner, almost instantaneously, an intense, profound and short anesthesia. The injection of the solution must be made rapidly and without too much handling. In this manner a profound sleep is induced, with disappearance in a few seconds of corneal and labiomental reflexes and considerable elevation of the threshold of the lingual-maxillary reflex. Furthermore, the blood pressure is lowered, the rate and amplitude of the respiration becoming considerably diminished. Sometimes (though rarely, if the proper doses are given; more often with larger doses or repeated injections at short intervals) a temporary dyspnoea more or less complete develops, but rapidly disappears again. We have never had any accidents with the proper doses.

"The results show that this method, which is quite convenient is particularly indicated in the cases where a very profound and very short anesthesia is required; this is of particular value in operations on the face and on the respiratory tracts."

(We hope some canine specialists will give this method a trial. Our own experience in giving, or attempting to give, intravenous injections in dogs indicates that it will not be a popular method unless they are much more skillful than we are. *N. S. Mayo.*)

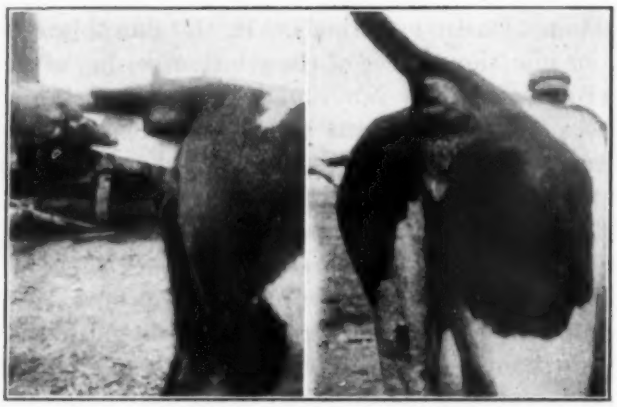
THEY GOT WHAT THEY DESERVED

Fines of $100 and $50 respectively were assessed recently, by Circuit Judge William B. Brown, against L. J. Osinga and Earl Ball, Byron Township (Kent County, Mich.) farmers charged with attempting to interfere with tuberculin tests being made by veterinarians from the State Department, at Lansing.

Both men pleaded guilty, and the sentences followed a protest from Judge Brown regarding lack of knowledge of laws tending toward the protection of public health.

The men admitted having injected turpentine into the tails

of their cattle, in order to interfere with the intradermal injections. Osinga was given the heavier penalty, as he admitted having actually performed the operations, both on his own and Ball's cattle.



Two "T (turpentine) 2x" Reactions
(Photograph supplied by Dr. B. J. Killham)

ABSTRACTS

PATHS OF INFECTION BY BACTERIUM ABORTUS IN RABBITS, GUINEA PIGS AND MICE. Everet S. Sanderson and Leo F. Rettger. Jour. Inf. Dis., 1923, 32, p. 181.

In their experiments the authors attempted to produce infection with *Bact. abortus* in guinea pigs, mice and rabbits by mouth, and guinea pigs and rabbits through the vagina and urethra. The results show that infection of these animals was easily brought about through these three avenues and that of the three species the mouse appears least susceptible. These observations form an interesting contrast to those carried out on cattle in recent years, especially by Rettger and White, who demonstrated the extreme difficulty of artificially infecting the bovine genus.

The authors, in their experimental work, do not regard positive serologic reactions in themselves as absolute proof of existing infection, but do regard them, except in very young, nursing animals, as indicating either present or recent infection and that consequently they are of great value in the study of transmission in cattle and other animals.

The results obtained by the mating of previously unexposed with artificially infected and reacting animals were negative. These experiments were few in number and actual mating was not observed. Their attempts to bring about infection in cattle through the vagina have often proved unsuccessful. The results also show that there probably was a transmission of agglutinins and other antibodies from the mother to suckling offspring through the milk.

S. S.

A Comparison of the Ziehl-Neelson and Schulte-Tigges Methods of Staining Tubercle Bacilli. Hyman L. Shoub, Jour. Bact., 1923, viii, 121-126.

The technic of the Schulte-Tigges method* of staining tubercle bacteria is as follows:

"1. Flood the slide with carbol-fuchsin (10 cc of saturated solution of basic fuchsin in 95% alcohol, and 90 cc 5% carbolic acid).

2. Heat the slide to steaming and continue the heating for *one* minute. Avoid excess heating.

3. Wash off the excess stain with tap water, and decolorize in sodium sulphite (10 percent aqueous solution of sodium sulphite). This solution should be renewed once per week and if convenient twice a week.

4. Wash *thoroughly* with tap water, and counterstain with picric acid (saturated aqueous solution of picric acid).

5. Wash with tap water, dry, and examine. The tubercle bacilli are red, the background is pinkish yellow."

By comparative tests on human sputum the author concludes that:

"1. The Schulte-Tigges method of staining tubercle bacilli is not more difficult than the Ziehl-Neelson method; it is easier.

2. It gives about 33% more positives.

3. It exposes over five times as many organisms.

4. It does away with the use of alcohol."

It is believed that the superiority of the method is due first, to the fact that sulphite appears to clarify the slides better than alcohol and second, that picric acid as a counterstain obscures fewer organisms than methylene blue."

W. A. H.

*Schulte-Tigges, H. Deutsche Mediz. Wchnschr. 1920, xlvi, 1225.

AMERICAN VETERINARY MEDICAL ASSOCIATION

Proceedings of Fifty-ninth Annual Meeting, St. Louis, Mo. August 28 to September 1, 1922

(Continued)

LARGE-ANIMAL CLINIC

THURSDAY MORNING, AUGUST 31, 1922

(Continued from p. 110, April Journal)

The meeting convened at eight-fifteen o'clock, Dr. Kingman presiding.

CHAIRMAN KINGMAN: I had the opportunity, last winter, of listening to a course of lectures given by Dr. Ferguson, upon the same subject he will talk about this morning, and if you knew the material that he has to give you, you would be willing to go a long ways to hear him. Dr. Ferguson, of Lake Geneva, Wisconsin.

DR. T. H. FERGUSON: Gentlemen: We will first review the the anatomy of the udder. The udder, as you know, is located on the bottom of the abdominal wall, in the inguinal region, and consists of two symmetrical halves, Each half is covered by its fibro-elastic envelope, and they are joined together in the center by areolar tissue. Each half has a distinct anterior and posterior quarter. Although there is no line of demarcation between them, they are separated by areolar tissue.

Now, while mentioning this areolar tissue, I just want to call your attention to the fact that in mastitis a good many times the two capsules of each half become adhered, the areolar tissue becomes organized, so in dissecting half of the udder a good many times it is a little bit difficult, if mastitis has existed for a long time.

Now, as I said before, the anterior and posterior quarters are distinct quarters; that can be demonstrated by injecting a blue solution in one and a red solution in the other. There is absolutely no connection, but for the surgical relief of chronic conditions, it is not wise to try to remove one quarter. You must remove half of the gland, unless the quarter affected is necrotic and has separated, and is only attached by the blood-vessels. Then the proper thing to do, of course, is to remove that necrotic part and ligate the blood-vessels.

The circulation, the blood supply to the udder, is the external pudic artery external pudic vein and the adbominal vein, *vena subcutanea*. The udder is well supplied with lymph-vessels and glands; the supramammary glands are situated superiorly and posteriorly. The skin and superficial parts of the udder are also supplied with lymphatics. The milk is secreted by little epithelial cells and poured out of these through little hair-like canals into the larger canals, several of which go to make up a lobule, and they, in turn, empty into larger canals and finally into the milk cistern, and from the milk cistern to the orifice of the teat through what is known as the milk duct.

The distal end of the milk duct is surrounded by a sphincter muscle, there being none in the superior part of the teat, near the cistern. There is a folding of the mucous membrane there, but there is no sphincter muscle. Sometimes there is muscular tissue there, but there is no well-defined sphincter muscle, like there is in the end of the teat. Now, I just mention those conditions because in treating mastitis, or in treating the udder with intra-mammary injections, it is well to remember those facts, and then you won't get in bad. Now, in amputating an udder, the one necessary thing to do is to get all of these blood-vessels; if you are taking out one-half of the udder, these blood-vessels, the vein and artery, also the nerve and lymphatic vessels should be ligated *en masse*, with a very strong ligature. If you ligate those before you dissect out the other part of the udder, you won't get very much hemorrhage. It is a little bit difficult, but it can be done nicely and they should be ligated *en masse*.

Now, each half of the udder is surrounded by a fibro-elastic capsule. This extends in between the lobules and forms interstitial tissue. The parenchymatous tissue, as Dr. Klein told us the other day, may become inflamed, and that is known as parenchymatous mastitis. The interstitial tissue may become inflamed and that is known as interstitial mastitis. He also explained the catarrhal mastitis, the mastitis that affects the mucous membrane of the teat duct, or the cistern, or going higher up and affecting the canals.

I think I will just say a word about obstruction of the teat first, because that is a condition that we are called upon to take care of probably more than any other one condition, and the causes of obstruction of the teat are many. The teat may become injured on the end, by another animal stepping on it,

or by the animal itself. So "treading" is one cause of injury to the end of the teat or to the teat that may cause obstruction.

Another cause is frost bites. A teat may become frosted and swollen, so that it is impossible to milk. To relieve the quarter of the milk, it has to be done some other way. The teat very often becomes infected on the end. This infection may spread through an entire dairy. You may have a lot of cases, in fact, most every cow in the barn may have an infected end of the teat. You would think by looking at it that it was due to an injury.

There is a little red ulcer right at the orifice, and the end becomes swollen and it is impossible to get the milk out. A cow may have one or more of her teats affected that way, and several cows in the same herd may be affected. Then the teats may be obstructed by cowpox, gaining entrance to the orifice by metastasis, and causing an obstruction of the end of the teat. Then again, catarrhal mastitis may cause obstruction of the teat anywhere above the orifice, and it even may extend up into the milk cistern, and into the larger canals. That is probably the cause of more trouble than any other condition that we have to deal with.

Very frequently we get this kind of a history of a case of obstruction that is caused from catarrhal mastitis. During the process of drying the cow up, the owner had difficulty in getting all the milk. Maybe there was more or less pain there, and he had some trouble in getting the milk, but thought the cow would be all right when she freshened. Upon freshening there is more or less complete obstruction, anywhere from the upper part of the lower third of the teat to the cistern, or even involving the cistern.

These obstructions, caused by catarrhal mastitis, may consist of a little tumor, from an eighth to a quarter of an inch in size, up to a condition that is called "spider." It extends from one wall of the teat to the other, completely occluding the lumen of the teat. The milk will come down to that portion of the teat and it is impossible to get it further. You may be able to force out a squirt or two from the end of the teat, but it won't fill up again for some time. That is commonly known as spider.

Then, again, you may get a membrane extending from one wall to the other, just a thin membrane, like a little diaphragm across the lumen of the teat. Catarrhal mastitis probably causes more trouble with a teat duct than any other one thing, although there are plenty of cases caused by these other condi-

tions I mentioned. That little infection that you will see spread through a stable, manifest by swelling, and a little ulcer at the end of teat, is quite a nasty condition and it is one that needs prompt handling in order to prevent a lot of damage.

Now for handling those cases where the obstruction is in the end of the teat, there are a good many ways that have been tried with more or less success, but the one that has given me the most satisfaction in all cases, although I don't adhere to this operation in every case, is the dividing of the sphincter muscle. I don't like to use or have a teat-tube used, because it is the history with using teat-tubes that most every cow develops a case of mastitis from the use of the tube. The owner may be a pretty careful man, and he may think that he is handling the thing clean, but his idea of cleanliness isn't always a good idea of surgical cleanliness. He may wash his hands and sterilize the tube and forget to disinfect the teat tip and orifice, and may crowd a little dirt up there, or may forget one of the other things to do, and most always, if you leave a case of that kind to be handled with a teat-tube, the cow loses that quarter from mastitis. So, in handling these cases in practice, it doesn't matter particularly what caused the trouble if the sphincter muscle is in shape so that it can be operated decently.

We usually operate with a concealed bistoury from the inside. Of course, there are rare cases that are hard, maybe for a space a little above the sphincter muscle, so that just dividing the sphincter muscle will not help that kind of a case. In those cases we just amputate the end of the teat.

And again, a teat may be so badly lacerated that it isn't practicable to try and save the end. If great damage has been done, it is better surgery to amputate that teat at once. In a good, substantial teat, with pretty fair length, there is usually enough muscular tissue in the wall, so that nature can form a new sphincter, which she does in a good many of those cases. If you make the amputation carefully, and under antiseptic precautions, take care of the post-hemorrhage and the teat goes on and heals. Nature very often takes care of the sphincter end of it and especially in cows with well-organized teats, good, big, long teats. They very often turn out to be as good as they were in the first place.

I had one Guernsey cow with extremely long teats. I had to amputate a portion of her teat twice, and eventually she made a nice recovery. That is, twice at intervals of probably a year.

Now most of us used to, in operating on teats for obstruction, take a teat bistoury, figure-eight a rope around the cow's hind legs, clean the end of the teat, maybe tie the cow's head to one side, introduce the teat bistoury and pull it out, once, twice, three or four times. I used to do that same thing, and I wondered why I couldn't cure a case now and then. Once in a while I accidentally would have pretty fair luck, and one would be improved, but the majority of them didn't do well, but since I started to just work on the sphincter muscle (and I have a great many cases where it is impossible to milk them out and almost impossible to introduce the tube into the lumen of the teat after dividing the sphincter muscle two or more times, as I think indicated) there is no trouble in milking that teat out right away.

There is one little danger afterwards, and that is that it might close up again. Any man that has had experience in the handling of those cases usually has no trouble in keeping them open without using tubes, but when I start to operate for some new dairyman, who hasn't had the experience of the average, I very often, after operating on them, burn a common match down about two-thirds of the way, roll a little absorbent cotton around the black part, dip that into a little etherized iodin or iodoform, and screw that up into the orifice so that it presses well against the incisions that I have made in the sphincter muscle. That usually golds the part open in nice shape, and at the same time it disinfects the wound nicely with just one application.

I don't usually do that unless it is some new man, whom I am just starting to do the operation for and who hasn't had any experience with the after-care. Very often he will have great difficulty in getting the milk the next morning, and very often he will telephone to us that the operation wasn't successful, that he can't get any milk, and we will go out there and do just what we told him to do and be able to milk the cow right out in nice shape, without doing any more than we instructed him to do. But it is a little better, if the man isn't very intelligent, to put the little plug in the end of the teat. It won't do any harm and it certainly will in many instances do a lot of good. Now that operation will take care of a pretty bad teat in nice shape. Of course, there is a necessary after-treatment in all of those cases, and I have found this out: that the man who follows out the after-treatment religiously has very good results with these cases; the careless man does not have as good results.

A short time ago I was called to operate on a very good cow

for a man. We had done the operation several times for him, and the fourth time he said to me, "I hope we will have better luck with this cow than we had with the rest of the cases."

I said, "Didn't you always have pretty good luck with these cases?"

He said, "No, we haven't had good luck with them."

I said, "That is rather curious; the majority of such cases come along very satisfactorily."

I asked him if he took good after care of the teats according to directions.

"Oh, yes, fine."

Now, we always leave a bottle of concentrated bichloride to follow up the after-treatment with, and I just happened to look in his medicine cabinet and I saw two or three bottles of this concentrated lotion that we had left there at different times. Some of it had cobwebs on it and some was dusty. He hadn't been using it. He hadn't been trying to help out the operation a bit; he had just been depending on the operation to cure these cows, and he hadn't been getting good results.

Now the after-treatment that I recommend has worked out very nicely. It isn't complicated; it is simple; it requires carrying out to have the best results. If the teats are handled in this way for several days, say three or four days, before and after milking, twice a day, then no further attention is necessary. By that time the teat will have come along in pretty good shape, and nature will take care of it. But for the first two or three or four days it is absolutely necessary to take nice care of the end of the teat.

Now as to this solution we use. When an ounce is added to a pint of water, it makes a one-to-a-thousand bichloride solution and I have found nothing better. I have tried iodin, glycerin, and most all of the different antiseptics, and I find that just that simple little antiseptic, applied hot, by soaking the teat in a little egg-cup or a little glass, for a minute or two, in a hot solution of bichloride, that we get the very best results, and that is all that is necessary to be done. Of course, the owner must rinse off his hands, too, before he milks; that 's a good precaution. It is surprising how well those cases do, and how little infection we get in them.

Now, I believe that the last time we figured up on the percentage, we got pretty close to ninety-five per cent good results on these cases that appeared to be caused form an accident, or

from that little infection that I was telling you about, that caused a hard end; we got pretty close to that percentage of good results.

The after-treatment, of course, looks simple. It would appeal to lots of veterinarians that it didn't really matter, and that it would be insignificant to wash off the end of the teat. A lot of boys who have come to work for me would suggest iodin or something else. They would think that was better, but it doesn't work out so well. Iodin causes the end to become too dry, and other preparations odorize the milk. There is no odor to bichloride of mercury solution, and you won't get in bad like you would with iodoform, or some preparations that odorize the milk. We have been using that for about fifteen or eighteen years, almost exclusively, and we like to use it hot and in that strength solution for those conditions.

Now, we have a regular procedure, of course, in doing these operations. As I said before, we didn't have very many cases that respond to the treatment Now we have a regular system for handling them. We come in and make the examination while the cow is standing, and if we decide to operate we paint the teat with etherized iodin. Just give it a good painting all over. Take a piece of cotton and wipe it all off thoroughly. Be sure and get some in the orifice, right in the teat, and then we lay the cow down.

The method that I prefer is the double, half-hitch method. Put a rope halter on the cow, snub her head to the ground, a half hitch around the neck, a half-hitch back of the shoulder and one in front of the external angle of the ilium. You are all familiar with that hitch. It is the best way of restraining a cow for a short or long operation that we have found.

After we get her down, we stretch her front feet one way, and her hind feet another, to two posts, usually; have the ropes long enough so that you loop a rope around one foot and give it a twist, and then loop it around the other. Then run the end of the rope around a post and back through. Then you can stretch the cow out in nice shape. After she is stretched, we tie the tail to the upper leg, because if you don't, just at the critical time, when you are going to start things, she will switch that tail around and hit your instruments or soil your hands.

We slip on rubber gloves; we have the instruments sterilized, and we boil them if we have to take time. We don't operate with dirty instruments. If a fire isn't at hand, we drop them in phenol, in 95 percent phenol, let them soak in there a little

while, and then rinse them off with alcohol. We have the instruments clean; then we slip up and do this simple little operation. Then put a little more etherized iodin on the teat and let her up. In those cases where we plug, we plug while she is down.

Now, formerly, I used bougies in a good many of those cases, and we had about the same experience with bougies that we did with the teat-tubes; infection would follow using them. We had the best results with a lead bougies and silver bougies, but I find that if you just burn match down to a point, pick up a little cotton with it, twist it, dip it into a little etherized iodin or iodoform, and screw it up in there, it will answer all the purpose that a bougie would, and in addition it disinfects those little wounds that you make. That is left in there until the next milking; I don't advise putting it back. We just introduce those plugs and the owner takes them out. He is instructed to just twist them out.

Now, I think I have covered everything. Relative to the operation for obstruction of the end of the teat, that can be handled by operating on the sphincter muscle. There are two or three other little operations that we do. I mentioned one of them; that is amputation. Where you can't successfully operate on the sphincter muscle, then amputate. There is another way of handling those, and that is to take a little knife, a thin-bladed knife of some kind, and just ream them out, starting in the center of the tip, introduce the knife through the orifice, and just ream them out a little. In some cases, where they are very hard and fibrous on the end, that is the best way to handle them. You take out just a little of the tissue right in the center. Take out enough so that you will get a free flow of milk, but if it is a heavy-milking cow, and she is on a full flow of milk, don't take out too much because if you do you will get a leaker.

Now, speaking about leakers brings to my attention hard milkers. We operate on a great many hard milkers. Those Holstein cows that are giving upwards of sixty or seventy pounds a day will just about wear out the man who milks them, and we operate to make them easy milkers. We have got it down so that we come pretty near making them do as we want them to. The operation is just the same as for obstruction of the teat. The operation is done on the sphincter muscle. This litttle, concealed knife is introduced through the orifice, pushed above the sphincter muscle, opened up and the cutting point introduced at the superior part of the sphincter muscle. You carefully

cut through until you can hear it pop. If you decide to divide it more than once, the next division won't make quite so much noise, but in a good, hard sphincter it will make a little noise, and then with the others you can just judge by the lack of resistance, when the blade goes through.

That, I believe, is about all I can think of relative to the relief of obstruction of the teat near the end. We have conditions, as I mentioned before, higher up, spiders and tumors and such. Now, when it is possible, I try to operate from the inside. After you get beyond the sphincter muscle here, most teats have plenty of room. There is plenty of room in the duct as I will show you. I will open up one; and you have quite a lot of room in there even if there is a constricted part up above. If you introduce a director first, and then either a very s nall pricking-knife, or an ordinary pricking-knife, into the groove and get it up in there, you can use it to quite an advantage. Withdraw the director and you can engage this tumor with the finger and thumb on the outside, and do quite a lot of operating on the inside of the teat. If you dissect this tumor loose, and it is too large to force out, after the orifice is dilated and the sphincter is dilated, why then it may be necessary to break it up or to cut it up with a knife before trying to get it out.

If I don't think that I can operate successfully by introducing an instrument in the teat duct, I prefer then to cut right down onto and through the growth, dissect it out, and, depending on the case, either suture or not, as conditions may warrant. I have operated both ways, and I have had a little better results with cows on milk by leaving them open, although a cow may be operated upon successfully, on a full flow of milk, if the proper kind of a drainage tube is used. The drainage tube should be a silver tube, long enough to go above where you have made the dissection, and it should be perforated at just about the sphincter muscle, so that it will drain the duct down to that point of the teat. If the tube does not have such a perforation, milk will flow down and collect around the sphincter muscle. A hole should be drilled. I will demonstrate what I mean.

You won't get good results from suturing unless you sew up the duct as much as possible, and then sew up the skin. There are cases where the growth is quite large, where you won't be able to do that, so you will have to depend on just sewing through the wall of the teat, putting in the proper sutures.

Now, I will just show you how I cut the sphincter muscle; it

is a very simple operation. I use just a common little bistoury, not just like this, but it will do. I don't usually have as long a knife as that. The cow would be lying down, that would be about the position of the teat and we will presume this is a hind teat. We would introduce the bistoury into the duct. Now, this cow has avery delicate sphincter muscle, so you would have to be careful with a cow of this kind and not cut her too much.

Just engage the knife blade at the top of the sphincter muscle, take a good hold and try not to injure the orifice or the mucous membrane on the end. I didn't do that as I usually do; I don't pull them through. Now I will try another instrument. We will just take this big udder right here. The idea is to put the bistoury right in there and get it up above the sphincter muscle. I think I have just a common bistoury in my pocket here, and I am going to get it. I will show you it can be done more successfully than with the other. We use this almost exclusively because we don't like to be bothered with a lot of instruments, and we have got results this way. There is certain care that you have got to give these little bistouries to have them working well. You must keep them sharp and well cleaned out on the inside so that they will actually work. We have them of different shapes, but this is a pretty fair shaped one; it hasn't got a set-screw on, but we can use it just the same.

You must remember that operating on dead tissue is altogether different from operating on a live case, but we will try to show you on this. We are careful not to cut way through. You want to cut through the muscle, but not through the wall of the teat, or we don't want to injure the orifice and make it bleed. Once in a while, with a bad bruised end or a bad infected end, we just divide the muscle right through the very wall of the teat, and we get quite a lot of bleeding. In those cases the packing with the match and the cotton is indicated. You can see that is milking easier right now. Now the old way would be to just stick in the knife like that and rip her down through. That is the way I find it commonly done by veterinarians, and they don't get good results.

It is a game of experience, getting the hard mikers just right. After you have done a lot of them you can get them so they will milk just about right, and they won't be leaking. Now you don't get a hemorrhage in hard milkers very often, if you operate carefully and confine your cutting just to the sphincter muscle.

Of course, if you ccidentally cut the duct or cut a little vessel in

the wall, you will get quite a little hemorrhage, but, of course, those teats that are injured on the end are very apt to be bleeders. The average treatment is just the same as for operating on an obstructed teat. It consists of washing the teat off before and after milking with a warm solution of one to a thousand bichloride of mercury. That is the treatment I have found best; it is cheap; it is economical, and the reason we put it up in concentrated solution is this: if you dispense the tablets, a man takes a tablet and dissolves it in a pint of water—that is, he throws it in a pint of water. The first part is weak and the last part is caustic, but if you pour the concentrated solution into water you get it all alike. It is just about the right strength; it will disinfect it in pretty good shape.

DR. MOORE: In amputating the end of the teat, do you insert anything like a soft rubber tape or anything of that kind.

DR. FERGUSON: I will just show you how we do it. We always lay the cow down. If we haven't much to do with a cow, we just lay her down and do it right. For a few years I got just a little bit lazy, and thought I could do a job standing up, and do it decently, and every time I have gotten in bad, so we don't make any bones about laying them down. In the first place we clean up the teat in nice shape, and then we slip a rubber band around the teat, right up at the base. Then we take a pair of forceps; of course, everything is supposed to be sterilized. We try and save all of the teat that we possibly can, even if the swelling extends up; all the teat we think will regenerate, we save, even if it is hard and swollen up above, so we will pretend that this teat has been macerated and is in bad shape and we will take that teat off right there.

You will notice with that kind of forceps your teat will be left in about the right shape. Now if you were to take off this rubber, it would bleed profusely, so we will just run the rubber down here and leave it on about two or three hours. Of course, disinfect the end of this thoroughly with some iodin, pure tincture of iodin. The follow-up treatment is just like it is for all teats, one-to-a-thousand, warm, bichloride solution. We leave that rubber on for about two hours and a half or three hours, and then we have the owner cut it.

It leaves a bloodless job; you have a fine finish to the job when you are through. Now, I will just take off another one here so these gentlemen can see.

DR. MOORE: Does that have a tendency to close that duct?

DR. FERGUSON: No sir, the milk runs right out, just like it is running out now, and runs more or less continuously all day long depending on the cow. It will run quite profusely, depending on the teat, for a week or two, then it will keep diminishing, and in a favorable case will get down so you will have to milk it out. Once in a while a cow with a weak wall never will form a sphincter. In those cases you can slip a rubber band right around the end. If you put on a clean rubber band right at the very end, it will cause irritation enough so that there is quite a little connective tissue thrown out and organized there, and that will make a pretty fair end of an otherwise bad teat. Usually nature does pretty well with those teats. Now, a good many times I make a little injection of cocain, or something of that kind, around the wall of the teat.

Now I will show you how we operate a fistula. I can't locate one except this old, rotten fistula from a diseased quarter. A milk fistula occurs anywhere from the lower part of the teat, right up to the cistern, or it may occur in the udder, up above the cistern, in one of the canals, but usually right in this location here. I can't very well show you how to do a fistula that doesn't exist, but I will show you the general plan of it.

We get the cow down, and we get the rubber on it first. Get the teat clean, slip the rubber band up above here, and then make a little injection of cocain around the orifice of the fistula. Now, presuming that black spot was the fistula, we would inject a little cocain right around there, then we would make an elliptical incision right through like this. Now that would include the epithelial tract that leads from the skin down to the duct which causes your fistula. Of course, it doesn't exist in this case, but I am going to show you how we dissect it out. We just slip a pair of forceps on the skin like that; take a pair of scissors and dissect that right out, right down to the duct. When you get through, you almost think you have a fistula there, but it isn't, of course. You dissect it out, the little epithelial tract that extends from the skin to the duct, and then you have the problem of suturing it. I just took the connective tissue; the duct is right here; I will cut that out.

Now, in suturing that up, we have to use a special stitch, or it won't hold. There are two or three ways of sewing. Where I want to include the duct in the suture I sometimes make a figure-eight stitch, which isn't hard to make, and it very often takes care of it in fine shape, so I will just show you how I do

that. I want to show you two ways of stitching these; either one may be successful. I just start in the skin here first, like this, just take it through the skin, bring it right over, slip her down through the duct. Now, I have been down through the duct and looped over and then back through the skin. That makes a figure-eight suture that folds the duct together and the teat at the same time.

Here's another one I use and like first rate, and that is just a through and through suture, taking in plenty of the wall of the teat, so as to get a good, firm amount of tissue. It is just the simple suture that you are familiar with, only you forget about them sometimes where they are useful. There are the two stitches.

Now, I will just do an operation for the removal of an obstruction. Here's one hard tumor right in the end; here's one that can be cured; there is a teat that can be cured by operating on the sphincter muscle, I think, right there. You can feel that hard swelling in it, just like a round hard marble. Now you see we just cut right through that growth. There is the duct and there is the part I operated on; you can see the incision right through that hard bunch. That would relieve that condition; that would let the milk out in nice shape. You can see how much space there is in a duct; you have quite a lot of room in there to operate after you once get in.

The gentleman asked about the cases where the obstructions are up high. I has been my experience, if the obstruction is up in the cistern, it is very apt to be up in the larger canals and those cases are hopeless. The best thing to do with them is to leave them alone in the majority of cases, and you will get pressure atrophy. If you do molest them, or try to operate them be very careful that you handle them in an aseptic manner, because if you don't you are liable to infect the quarter and get a mastitis that might prove fatal, not only to that quarter, but to the life of the cow.

DR. WAY: What about that little place where the teat sets on?

DR. FERGUSON: That is the high part, and those we operate right at the base of the teat, but I have found that the higher

QUESTION: Do you wait until there is acute inflammation up you go the less apt there is to be success.
before you operate?

DR. FERGUSON: There isn't acute inflammation in those cases; they are usually chronic cases; they follow catarrhal

mastitis. Of course, there is congestion there, that very often occurs at parturition time; then you would have to operate to relieve the teat if you were going to do the operation, so you couldn't hold it up. You would have to go ahead and operate just the same.

QUESTION: Would you operate on a fresh cow that way?

DR. FERGUSON: You would have to have it done that way on a fresh cow. If you were called to a case where they couldn't get the milk, and you located the obstruction in any part of the teat, it would be up to you to decide what was best to be done with that, or whether it was best to do anything with it or not. If you think you can operate on it from the inside, from within the duct, why that is the best thing to do. If you can't do it that way, then the next best thing is to cut right down upon the growth and through it.

Of course, you want to use a local anesthetic and make the job clean. If it is up pretty well you cut right through the wall of the teat, just like that incision is made, right down through the growth, and then you just dissect out that growth like I am doing here now on this good teat. There is no growth here, so we will just take out a piece, but there is generally plenty of evidence of growth, so it doesn't make quite as long an incision as that, but don't be afraid of an incision. The fellow who makes a little bit of an incision, and tries to get in there and operate, is out of luck, because he will never do a good job. Make a big enough incision, so you can get what you want to do and get it out in good shape.

It is a good plan to have an assistant help you, and in a good many cases it is the farmer that helps you. You take a loose pair of forceps and slip a rubber tube over the ends in order not to hurt the end of the teat, and an assistant can hold that teat out so you can operate with instruments. We don't get our hands in it; just cut down through there and dilate it.

QUESTION: What is the after-treatment?

DR. FERGUSON: That is for you to decide; if you leave the wound open, the milk runs out. The after-treatment is to treat it with iodin, about twice a day, for three or four days, and then about once a day, and just let the milk run out. A great many times it is followed by a milk fistula, but sometimes it will heal up. If you are going to use the tube, then you introduce a silver tube right in the teat, one that has been perforated down here, just above the retainer, so that you will get drainage. If you

have it perforated from this point down here through this hole just above the base, there won't be any question about it. When you do that you suture the wall of the teat in nice shape and put a dressing on there. Collodion is very good. Dry the teat well and paint on a little collodion, a little cotton and a little more collodion and so on, and you can put a band around there in good shape.

QUESTION: How long do you leave that teat-tube?

DR. FERGUSON: About eight or ten days.

QUESTION: What do you think of etherization of the udder?

DR. FERGUSON: That is all right in some cases, if you put a little iodoform in the ether, but I am not very strong for etherization.

It seems I am taking up another man's time, and I am going to quit. (Applause).

CHAIRMAN KINGMAN: We have taken some of Dr. Joss' time, and it is too bad; we owe him an apology for it. I have listened to Dr. Ferguson for two weeks at a time, and I know just how interesting he is, but we have to divide it in the way it should be divided and give every man his share, so, Dr. Joss, we are sorry that we infringed upon your time.

DR. J. W. JOSS: It is entirely alright.

Gentlemen, hog cholera is a septicemic disease, it being contagious and infectious, and may be acute or chronic. The disease is characterized by hemorrhages of the tissues, complications of the intestinal mucosa, and by less frequent hemorrhages of the lungs. The manner of infection is either direct or indirect. The characteristic symptoms of hog cholera are a rise of temperature, loss of appetite, staggering gait, the weakness being most marked in the hind quarters, rapid loss of weight, constipation followed by diarrhea, which persists until the death of the animal.

In order that you might observe the ante-mortem symptoms of this disease, we have arranged to show you eight pigs which are at this time eligible to release for the production of either hyper-immunizing or simultaneous virus, as the case may be, and if some one will please drive the eight cholera-affected pigs into the holding-pen before us, I shall try to demonstrate the actual ante-mortem symptoms of hog cholera to this clinic. While this is being done, we shall discuss a few of the lesions which are given particular attention when such animals are autopsied at licensed serum establishments.

In my opinion one of the best indicators of hog cholera is the

congested and inflamed cervical lymph glands, especially in pigs which have been sick for but a few days. The mesenteric chain of lymph glands is considered next in importance, but in advanced cases of the disease.

Following this, a careful examination is made of the lungs, petechiae often being found, as well as pneumonic areas. Examination is made of the kidneys and petechiae are almost constantly found in them, where pigs have been inoculated eight days, and which have shown three-day sickness. If the everted bladder is carefully examined, you will frequently find petechiae scattered over the surface. Oftentimes an examination of the inner lining of the stomach will reveal that it is highly inflamed, and I have been informed by those who are supposed to be experts in the diagnosis of swine diseases that it might be the only lesion found in the first animals dying in a herd of swine affected with hog cholera, and I shall now show you a few of the stomachs, which are inflamed, removed from pigs sick of hog cholera for two days, being killed seven days subsequent to inoculation.

I do not believe that the stomach lesion is considered very important by many practitioners, probably because it is difficult in the field to examine it, it being necessary to wash the interior thoroughly before it can be properly examined. It is my opinion that you will find at least 80% of the stomachs of animals affected with hog cholera quite well marked with inflammation, and this often applies to pigs which have been killed on the seventh or eighth day subsequent to inoculation. I might state in this connection that pigs of this class should show visible symptoms of sickness for at least two days, and preferably three. This makes more certain your diagnosis of hog cholera than it would be to kill the virus pigs after one day of sickness.

A few lymph glands have been collected and will be passed around for your observation. The first of these are all diseased with hog cholera. Towards the latter part of the display we shall pass around some cervical glands, which were taken from hyperimmune hogs, apparently healthy at the time of post-mortem examination, and you can easily see the difference between the normal and those that are affected with hog cholera.

Some of these glands are not so very well marked with inflammation, while others are. You will find this condition existing in a hundred head of pigs that might be killed on the 7th day following inoculation with virus. Those of you who are practic-

ing, probably conduct autopsies on pigs after they have succumbed to the disease. In those cases I suspect it is probably about 15 days from the time of infection that they die, and that you find lesions more marked than in these cases, but it is suggested that you examine the lymph glands carefully in your first animals that die, and it will aid you materially in making the proper diagnosis.

On the little tray that has the normal glands you will observe no inflammation. Those were collected from hyperimmune hogs which were bled for serum purposes this morning.

The next most common lesions that we find are the petechiae of the kidneys, and I shall pass these around for your examination. You can see the hemorrhages on the surface. These lesions would be more marked if they had been collected from animals dying on the 15th day following exposure to the disease.

The lesions which you have just seen were collected from pigs killed seven days subsequent to inoculation. The inner surface of the bladder should always be examined, as in most cases petechiae or well-marked inflammation is found. The gland with the large area of inflammation was taken from a hog that was condemned at one of the establishments having Federal meat inspection, and you will note that it is much more marked than any of the others.

Here is a stomach taken from a pig that was inoculated seven days prior to killing, for hyperimmunizing virus. The inflammation is very extensive. Here is a normal stomach, taken from a hyperimmune this morning, and you can observe the difference. There is no inflammation, while on all the other specimens you will find this quite marked.

QUESTION: Do you always find stomach lesions in hog cholera?

DR. JOSS: I believe you will find them in 80% of the stomachs opened and carefully examined.

QUESTION: You find petechiae on the kidneys more than that, don't you?

DR. JOSS: Yes, especially where the disease is more advanced. In my opinion the cervical glands and bladder are the best indicators for the diagnosis of hog cholera. Occasionally you will find petecheae in the kidneys of hogs which are apparently healthy.

Here is the skin lesion of a hog that probably had cholera existing in its system for at least twelve or fifteen days. You will notice the large area of inflammation on the surface of the skin.

This is the ileo-cecal valve, and you will find some ulcers near and surrounding the valve.

This is a section of the vertebrae, taken from the same hog from which the skin lesions were collected. The bone has bleached some, but you can see that it is much darker than the normal vertebrae should be. Sometimes they are quite black, and I believe if the practitioners are in doubt as to the cause of the death of the animal, it will aid them if a longitudinal section of the sternum is made, as the bone in advanced cases will be dark, this condition being characteristic of hog cholera.

These are the lungs from the animal from which the section of the bone and skin lesions were taken. There is considerable pneumonia present. The larynx and trachea often show intense inflammation, as well as petechiae. By observing this trachea and larynx you will see that inflammation is present.

Your attention is now directed to the pigs in the ring. These animals were inoculated on the 24th of August, today being the seventh day following inoculation. They were inoculated with a virulent strain of virus, receiving three cc subcutaneously. These pigs remained well up to and including the fourth day; on the morning of the fifth day they commenced to show visible signs of sickness. The temperatures of these animals this morning are 107.5°F., 106.2°F., 107.2°F., and 106°F. The temperatures yesterday were 106.6°F., 106.2°F., 106.8°F., and 107°F. The Bureau requirements are that if they are well, up to and including the fifth day, we do not take the temperature until they show visible signs of sickness. These pigs will be killed this afternoon. You can notice they have lost weight rapidly, their backs are more or less arched and they are rather indifferent to surroundings, and I think most of them will lie down in a short time, showing effects of the disease.

The three pigs that we have here before us, were killed this morning and were out of the same bunch from which these four were selected. In conducting the autopsies of these animals, the cervical glands at the angle of the jaw are both incised. We do that to see if the animal is affected with either cholera or tuberculosis. The lungs are examined, the kidneys, the spleen, the intestines and the bladder. The spleen in seven-day pigs, I believe, is practically normal. You will not find in it much enlargement nor any alterations in pigs that have been inoculated, say seven days prior to killing. It is very unusual for you to find any splenic lesions, but as the disease progresses, along about the

twelfth or fifteenth day, then you will find a soft, dark and enlarged spleen, but not in the seven-day pigs.

Now, are there any questions? I believe my time has just about expired. I might state that the mesenteric chain of lymph glands is very important in diagnosing hog cholera, too. You will find them highly inflamed in advanced cases, just like you do the cervical glands and it is very important, I think, to have these examined. (Applause).

CHAIRMAN KINGMAN: Dr. Cahill has consented to discuss the subject of necrotic enteritis. Dr. Cahill. (Applause).

DR. CAHILL: Gentlemen, I don't know why I was selected to talk on this subject unless it is because there is so little to say. I think the only sensible way for us to feel about necrotic enteritis is that it is a seconday condition. There are cases where one feels that he is dealing with a primary etiological factor that is responsible for acute enteritis, and in these cases it has been found that *Bacterium paratyphosum* is usually an etiological factor, but I think all men who have had much experience with necrotic enteritis are agreed that they are seldom called until after the disease has passed this stage. The cases more frequently seen are those of a chronic nature, affecting rather a small percentage of the herd, and usually a sequel of some other condition. It is generally characterized by chronic emaciation and a progressive weakness and loss of flesh.

We frequently hear this condition spoken of as intestinal necrobacillosis. I think it has been so thoroughly proven that this name is erroneous that it needs little discussion. *Actinomyces necrophorus* is not capable of causing necrotic enteritis, if our present information regarding this organism is correct. Those who have worked with that particular organism have been unable to reproduce necrotic enteritis.

Actinomyces necrophorus is very frequently found, however, when sections or smears are made from the intestinal mucosa of infected pigs. It is found in very much the same manner as the same organism is found in other conditions, and, therefore, it should be considered, not that this is necrobacillosis, but that *Actinomyces necrophorus* is afforded an opportunity to cause pathological changes, characterized by necrosis, only after some other organism has set up the primary focus and made conditions favorable for *Act. necrophorus*. Not all investigators are agreed regarding necrotic enteritis. I think, however, that it can be said that all investigators do now agree that it is a secondary

condition, and that it may be caused by any one of several different organisms. The ones which are most commonly blamed and most frequently found in this disease are *Bacterium suipestifer*, *Bacterium coli* and *Bacterium paratyphosum B.*

Experiments reported by Dorset, at the last meeting of the United States Live Stock Sanitary Association, show that *Bacterium suipestifer* is a very active organism in this necrotic enteritis, and that swine that were immune to cholera are less liable to be affected with this condition than are susceptible swine. His investigations have not been completed. They are, however, in line with those of many others, since it has been shown by others that swine which are devitalized by any condition, such as a primary infection of the lungs, or by intestinal parasites, are extremely liable to have necrotic enteritis.

Personally I believe that *Balantidium coli*, or the plain round worm, is more frequently responsible for necrotic enteritis than any other condition, unless it be a primary infection of the lungs caused by *Pasteurella suiseptica.* There is one other rather characteristic point about necrotic enteritis, and that is that it is generally a filth-born disease; it is not often seen in sanitary pig lots. When paddocks, fields, or pens are used continually, over a period of years, for raising swine, diseases of swine other than cholera become prevalent and this is particularly true of hemorrhagic septicemia and necrotic enteritis. The organisms which are supposed to be the cause of this condition find a very favorable habitat in insanitary hog wallows, in poorly kept barns, sheds or paddocks, and on soil which has been used for raising swine for many generations. I believe that the most efficacious treatment or rather the most efficacious prophylaxis is sanitation. If barnyards and paddocks were kept clean and hogs were not allowed to have access to these insanitary conditions, there probably would be very much less necrotic enteritis.

There is one great danger, I believe, connected with the diagnosis of necrotic enteritis as such, and that is that we may overlook another condition. The lesions of necrotic enteritis are frequently found in swine affected with cholera. Such lesions are not caused by the filterable virus of cholera, but by the bacteria mentioned.

Now, inasmuch as we find these lesions so frequently in both conditions, we might very easily overlook hog cholera which is combined with intestinal lesions, and unless one can be sure that

the filterable virus of hog cholera is absent, he should beware of diagnosing necrotic enteritis.

We have some specimens here this morning that Dr. Joss has been good enough to procure for us, and I have just been wondering whether we are going to have a demonstration of necrotic enteritis or ascariasis. It looks to me as though we might get both. I think we all recognize in these cases symptoms which are ordinarily thought of as necrotic enteritis. At the same time these small pigs are just about the right size for pulmonary ascariasis. They are showing the symptoms which generally follow a prolonged affection with that parasite, and so I would suggest that in all cases of this kind we be on our guard particularly for ascariasis when we think we are dealing with necrotic enteritis, because naturally any treatment or any preventive measure which we might carry out for necrotic enteritis other than sanitation would have no effect whatever on ascariasis.

We have spoken of the various things which may cause necrotic enteritis, the various supposed etiological factors, and I feel that we need to say little about the symptoms, other than the progressive emaciation and loss of flesh. This condition is generally spoken of as a drying-up disease, and as we see here, it is very well named.

The pathological changes are confined almost entirely to the intestinal mucosa. We have first considerable congestion of the mucosa, accompanied by congestion and infiltration of the mesenteric glands. Some animals may die before the infection progresses beyond that stage. This is particularly true when *Bacterium paratyphosum B.* is the etiological factor. Ordinarily however, in herds where old wallows or other insanitary conditions are present, the primary stage is completely missed. The owner is not the best observer in the world and he fails to observe the primary symptoms which might be observed by one who is more acute.

Therefore, the first symptom which is observed, as I say, is the gradual emaciation, and an autopsy at that time indicates that the infection has progressed beyond the stage of congestion of the mucosa. Our next pathological change is a thickening of the intestinal mucosa and the musculature. Usually the entire intestinal tract is very badly swollen, which may even progress to a point that the lumen is almost closed. This very rapidly progresses, then, to necrosis and we get first a small localized, somewhat irregular patch of necrotic material. It is somewhat cheesy, tending to be deep-seated, very much the same as or-

dinary necrosis, which gradually tends to become confluent until large areas of the intestines are involved.

This gradually assumes a drying-up condition, until the entire intestinal mucosa may have the appearance of leather, being very thick, very dry and tough. Naturally while this condition is progressing emaciation is marked, inasmuch as the pathological changes which have been so briefly described make it almost impossible for the system to assimilate the food which is ingested.

Now, if Dr. Schwarze is ready, I believe possibly our best chance of continuing the subject would be to autopsy some of these cases.

This animal died before it could be destroyed and I presume will make a very good specimen. I know nothing whatever of the history of these cases, but we ordinarily find a chronic lung infection in conjunction with the intestinal infection. In this case we have to guess whether or not this primary lung infection was present because we do not know what the symptoms were. From experience I would rather expect to find such a chronic focus in the lungs. The glands are practically normal; there is a slight infiltration, but nothing of any importance.

The average case of necrotic enteritis is not difficult of diagnosis. It is simplicity itself, compared with the diagnosis of hog cholera and hemorrhagic septicemia, because the pathological changes are so marked, so different from those observed in other diseases that there is little difficulty in diagnosis. It seems to me the most important thing connected with this disease in so far as diagnosis is concerned, is to realize that we have conditions here which are so frequently associated with cases of hog cholera which have been of long standing, and that these lesions are not the lesions of cholera, and should they be observed as post-vaccination trouble, every effort should be made to determine whether the chronicity indicates an infection previous to immunization. As a rule there are no petechiae in the kidneys.

CHAIRMAN KINGMAN: Mr. Plaisance wishes to show you the pigeon that was before us yesterday.

MR. PLAISANCE: This is the pigeon that was paralyzed yesterday and that we treated with the vitamin product. He has had it a little difficult, because he has been in a wet cage and these birds have a subnormal temperature with this paralysis. That being the case, of course, with a subnormal temperature and a wet condition, he is not quite as pert as he should be. He is not quite as pert as I would expect him to be this morning,

but you will notice the difference between this pigeon today and the condition it was in yesterday. You will notice he can walk today; yesterday he was unable to do that. (Applause).

Yesterday you remember he was paralyzed and his head was drawn back. That just shows you the effect of water-soluble B vitamin in correcting the deficiency disease known as polyneuritis, or the disease affecting the nerves through the deficient diet. I thank you. (Applause)

DR. CAHILL: The lungs are in very bad shape and will be discussed better by the next speaker. We have every evidence here of a long-standing and primary infection by some other organism, possibly *Pasteurella suiseptica*, and you will observe around the ileo-cecal valve there are several button-ulcers. It is difficult, of course, to say how old these ulcers are but undoubtedly they are less chronic than the infection of the lung. Apparently this animal suffered more from its lung condition than from necrotic enteritis.

CHAIRMAN KINGMAN: While they are working on this autopsy, we will give you the opportunity to ask Dr. Joss the questions that you had in mind, since his time was cut short.

DR. TREMAN: I would like to ask the doctor to differentiate a little bit in post-mortem lesions between cholera and hemorrhagic septicemia.

DR. JOSS: I believe that is a pretty difficult question to answer, doctor. In answering that question I would prefer to know some of the ante-mortem symptoms and then associate those with the post-mortem findings. Then you might be in a position to judge more correctly. I believe it is a pretty hard matter to differentiate between those two diseases. I would think you would have, in your swine, hemorrhagic septicemia more of a pulmonary disturbance than you do in hog cholera.

DR. TREMAN: Is there any difference in the appearance of the glands, do you think?

DR. JOSS: Well, I believe that the bronchial glands, especially, are much more enlarged than they are in cholera, more highly inflamed. In those cases that I have seen, that they called hemorrhagic septicemia, they were as large as a hen's egg and very highly inflamed. I believe also that in the case of hemorrhagic septicemia the onset of the disease is very sudden, with a large number of animals affected with the characteristic flanky breathing, accompanied with violent coughing.

DR. TREMAN: Oftentimes we find the glands are black and

infiltrated all the way through; other times just petechiated. Is there anything characteristic about either one of these conditions?

DR. JOSS: In this connection, I would say no.

DR. TREMAN: My idea was to try and learn something, some way of differentiating the lesions, if there is any.

DR. JOSS: My personal opinion is that you will find as much diarrhea in hemorrhagic septicemia, especially of the intestinal type, as you do in hog cholera.

DR. EMERY: I was just saying what we do at the post-mortem of hogs in transit. When we find a hog with the tissues absolutely or apparently normal and showing no indications of chronic diseases, we are likely to be more suspicious of hemorrhagic septicemia than we are of cholera. Of course, that is where we have no knowledge of the ante-mortem symptoms.

DR. CAHILL: The specimens of the second pig are being passed around. I think every one who sees them will be impressed by their negative character. It is one of those autopsies that are held so often on these chronic, emaciated pigs, in which the veterinarian is sure that he is going to find chronic intestinal lesions and then fails to do so. I think you have all had that experience. It is quite a common one.

You will notice particularly that the lungs are comparatively free from chronic pathological changes with the exception of the apical lobe. I would rather be inclined to think, from talking to Dr. Ransom, that in this particular case we probably had a primary devitalizing condition of pulmonary ascariasis. This slight edematous condition, without having well marked edema, is quite typical of a pulmonary type of ascariasis, and with the lesions which we have here. The thickening of the intestines and the diphtheritic exudate around the ileo-cecal valve, indicate that if this pig had been allowed to live he would have undoubtedly developed necrotic enteritis.

QUESTION: What is your diagnosis on the first?

DR. CAHILL: Probably hemorrhagic septicemia.

We have here pretty much the same condition that we had in the first pig, a primary infection in the lungs.

Here we have that lung filled with serous exudate. Here again we haven't any well marked necrotic enteritis. It seems to me that these three cases serve very well to illustrate the contention that necrotic enteritis is always secondary, and that we start with some other infection or some other localized condition

—ascariasis or some pulmonary infection, such as hemorrhagic septicemia.

I think that needs to be taken into consideration in our diagnosis and prognosis, because finding pigs with practically no intestinal lesion doesn't preclude this extremely bad lung.

CHAIRMAN KINGMAN: Dr. Cahill will take a few minutes to answer some questions on necrotic enteritis.

DR. CAHILL: Before I answer any questions I want to say that Dr. Schwarze has dug out a good specimen for us, and that will be passed around. I haven't seen the lungs of this pig but evidently we will find the same conditions.

Here we have a good specimen of necrotic enteritis, except this has not gone on to the intense, dried-up, leathery mucosa that would come later. This has a blackened appearance and looks as though the pig has had a depraved appetite, which is associated with the primary stages of this disease.

QUESTION: Do those cases have high temperatures?

DR. CAHILL: As a rule, no. But in the primary stage, when the animal is first combating infection from the organisms which are normally present in the intestinal tract, and which are enabled to cause pathological changes on account of previous devitalization, we do have a rise in temperature. With a pig having lungs like the first one, we would have a rise in temperature, but in typical necrotic enteritis we rarely find it.

QUESTION: In unvaccinated hogs in which you find necrotic enteritis and evidence of hog cholera, do you recommend serum-virus treatment?

DR. CAHILL: It all depends on the local conditions, doctor. If I do, I want to advise the owner to expect a heavy loss, because you will sure get it when you put virus into that kind of a pig. Serum-alone treatment should be given.

CHAIRMAN KINGMAN: Dr. Schwarze will take up the subject of hemorrhagic septicemia in swine. (Applause).

DR. SCHWARZE: Gentlemen, we have some pigs here that have symptoms somewhat different than we usually find in the ordinary case of hog cholera. Of course, we will have to take into consideration, probably, strictly hog cholera or strictly symptoms of this particular disease.

It will be noticed that the appearance is that of an infection of the thoracic cavity, rather than a general devitalized condition, which you notice in hog cholera, and you will also observe that

you usually have constipation in this condition, where otherwise you might possibly have a diarrhea.

Here are a couple of pigs that are quite typical of the condition. It seems that when pigs of this kind are vaccinated, the response is very poor. It does not make much difference how much serum you give them, or how little virus you give them, the results seem to be about the same. The mortality in them is not as large as it is in a cholera hog. However, if the surroundings are not favorable, the mortality may be quite heavy.

(I wish you would drive those pigs out here a little further so we can get a better view of them.)

Now, by taking blood from a pig like that and injecting it into cholera-susceptible pigs, you will not produce a disease of any kind, which seems to show that there is no hog cholera virus present, or that this infection is not in the blood. However, I think there is a period when the infection does get into the blood and that is probably during the agonal stage or shortly before death. I think there is a possibility that often the infection gets away from the thoracic cavity through the circulation.

As to lesions, it is a hard thing to say. We sometimes find lesions that are quite typical of hog cholera. At the same time, as I say, blood can be injected into an animal and you cannot reproduce the disease. On the other hand, we find a practically lesionless condition. The temperature is very erratic in these cases. Sometimes it runs up to 107 and 109, and maybe higher. In other cases there may be a subnormal temperature; however, I do believe that at one period of this disease there was a high temperature and that this lowering of the temperature is probably a reaction from these severe attacks.

Take the lungs, for instance. You would think that they may be completely consolidated. Sometimes they breathe with difficulty, while at the same time when you hold a post-morten you will find, not a true pneumonia, but rather an edema of the lungs and perhaps pneumonic or consolidated areas throughout the different portions of the organ, especially the apices of the lungs.

The blood usually has a very dark color which seems to show that oxidation did not take place properly, and instead of coagulating, like ordinary blood, it will gel and is difficult to defibrinate.

QUESTION: Are these natural cases?

DR. SCHWARZE: Yes. These are natural infections, and the

thing that I should say and impress upon your minds is that this disease does not seem to be very fatal, contagious or infectious under certain circumstances.

I hardly know how to define it from that standpoint. It seems that the germ is harbored in these animals and as long as everything goes along alright, and they are kept under a normal condition, and their resistance not lowered, through some external or unknown cause, they will not develop it. However, it seems that any one of the many causes that may lower the resistance of these animals will have a great tendency to predispose them to this disease and they will develop it.

We will kill one of those pigs and see what particular lesions they will show.

QUESTION: Have they been vaccinated?

DR. SCHWARZE: These pigs have been vaccinated. That, however, does not make any difference, if the vaccination period has gone beyond the time of the incubation stage of hog cholera. We get a great many so-called "breaks," thirty, sixty, ninety, and one hundred and twenty days after vaccination. In those cases you would not be very likely to demonstrate any hog cholera virus, while on the other hand, if an animal would get a complication of this condition following vaccination, inside of thirty or thirty-five days, you would be almost sure to demonstrate hog cholera virus, for the simple reason that it was injected there in the first place, and not because this disease is complicated with hog cholera. It can be a disease that occurs specifically in itself. It may occur in combination with hog cholera, or you might say, *vice versa*, hog cholera may be complicated with this particular disease.

QUESTION: How long have these hogs been sick?

DR. SCHWARZE: About twenty-four hours.

QUESTION: Could you produce this disease by experimental inoculation?

DR. SCHWARZE: I believe you can. I would not want to say anything very definite on that, but I believe you can.

Gentlemen, I remember one case in particular where a bunch of hogs were dying; about thirty-five percent of this herd died. It was a herd that had been vaccinated probably sixty to ninety days, previously, and some of them probably a year or two. We isolated the bipolar organisms out of these cases, and were able to demonstrate the condition typically by artificial inocculations. This particular organism, at that time in a pure culture, gave the

appearance of a coccus, rather than a bipolar organism, and we worked with it for several months, trying to satisfy ourselves whether it was a coccus or a bipolar organism that was causing this condition.

In the pure culture we would always demonstrate the coccus form, in fact a person was not safe in calling it anything else but a coccus unless he knew differently. However, when we would inject that culture in small laboratory animals, and would make smears of the blood of these animals, we would get the typical bipolar every time. So we finally concluded it was without a question the bipolar organism we were dealing with.

QUESTION: Are mature hogs very often affected with this condition?

DR. SCHWARZE: Not so much so. It seems the age of the hog has a great influence as to its susceptibility. However, they are not immune by any means. I have seen whole herds of one-hundred-and-fifty or two-hundred-pound hogs become affected with this condition.

QUESTION: Can you make any differentiation between this and what has been described as hog "flu"?

DR. SCHWARZE: No, I can not. As far as the name of the disease is concerned, that is an open question. I do not care what it is called, as long as we recognize we have something else besides hog cholera. It is giving us a whole lot of trouble and that is of more interest to me than anything else.

CHAIRMAN KINGMAN: While these lesions are being prepared, we will listen to a few words from Dr. Eichhorn, regarding swine erysipelas. Dr. Eichhorn. (Applause).

(To be continued)

TOO LATE

A negro was trying to saddle a fractious mule, when a by-stander asked, "Does that mule ever kick you, Sam?"

"No, suh, but he sometimes kicks where I'se jes' been."—*Boy's Life.*

WHEN BILL WAS FRANK

Registrar (to freshman): "What is your name?"

Freshman: "Jule, sir."

Registrar: "You should say Julius." (To next boy): "What is your name?"

Second Boy: "Billious, sir."—*'Ee-'Aw.*

OTHER MEETINGS

PENNSYLVANIA STATE VETERINARY MEDICAL ASSOCIATION

The fortieth annual meeting of the Pennsylvania State Veterinary Medical Association was held this year, as it has been for the past few years, in conjunction with the annual meetings of all Allied Agricultural Associations of the State of Pennsylvania. Agricultural Week this year brought together the following organizations:

Pennsylvania State Veterinary Medical Association
Pennsylvania Breeders' and Dairymen's Association
Pennsylvania Holstein-Friesian Association
Pennsylvania State Poultry Association
Pennsylvania Sheep Breeders' and Wool Growers' Association
Society of Farm Women of Pennsylvania
Pennsylvania Threshermen and Farmers' Protective Association
Market Masters of Pennsylvania
Marketing Conference
Pennsylvania Tobacco Growers' Association
Pennsylvania State Beekeepers' Association
Pennsylvania Potato Growers' Association
State Horticultural Association of Pennsylvania
Pennsylvania Farmers' Cooperative Federation
Pennsylvania Department of Public Instruction

The great advantage of having the veterinarians of the state meet with the other Allied Agricultural Associations is apparent at once. After several years' trial the only objections that have been raised, by the members of our Association, are the great congestion of hotels, restaurants, etc., when all of the organizations meet at one time, and the fact that arrangements of this sort make it impossible to have our Association visit various sections of the State. Both of these objections can be overcome by holding our meeting with other associations the year that the legislature is not in session, and "legislature years" go to other sections of the state.

The plan of last year was followed with reference to our program. All twelve of the veterinary clubs, which have been

organized throughout the State of Pennsylvania, were invited to select a member to represent each club on the State Association program. As the veterinary clubs are made up largely of practicising veterinarians, this plan insures a liberal number of good practical papers by practitioners.

In addition to the papers presented by the representatives of the veterinary clubs, Dr. C. J. Marshall, Professor of Veterinary Medicine, of the School of Veterinary Medicine, University of Pennsylvania, presented a paper "Fat Necrosis in Cows and its Relation to the Diagnosis and Treatment of Sterility."

Dr. Adolph Eichhorn presented a paper on "Swine Disease." Dr. Wm. J. Lentz, of the Veterinary School, University of Pennsylvania, read a paper on "Obstetrics in Small Animals." Dr. E. L. Stubbs, of the Pennsylvania B. A. I., presented a paper on "Poultry Problems." Major A. L. Mason, V. C., U. S. A., presented a most interesting paper relative to the "Veterinary Officers' Reserves Corps of the U. S. Army." Drs. John Reichel and J. E. Schneider presented a paper on "Canine Rabies Vaccine."

Dr. W. S. Gimper, of the Pennsylvania B. A. I., read a very interesting paper on "Pennsylvania's Meat Inspection Service," quoting authorities to show meat inspection was given serious consideration in Pennsylvania even during the colonial days.

Many of these papers have already been published in the JOURNAL of the American Veterinary Medical Association and additional papers will be submitted for publication in the near future.

The meeting was very well attended and the entire membership took an active part in the discussion of all papers presented. There was a air of optimism about the practitioners present. It was felt that the profession had seen its darkest days and that with better live stock prices prevailing, a greater demand for good horses and a larger share in tuberculosis eradication work, the future looked brighter than it had at any time during the past three or four years.

The election of officers resulted as follows:

President, Dr. N. H. Allis, of Wyalusing; Vice-Presidents, Dr. S. G. Hendren, of Lewistown, and Dr. Thomas James, of Scranton; Recording Secretary, Dr. C. S. Rockwell, of Philadelphia; Corresponding Secretary, Dr. R. M. Staley, of Philadelphia; Treasurer, Dr. Thomas Kelly, of Philadelphia.

VIRGINIA STATE VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Virginia State Veterinary Medical Association was held on January 11-12, 1923 in the parlors at Murphy's Hotel, Richmond, Va. There were forty of the practitioners of the State present at the roll-call. The meeting was opened by an address by the President, Dr. H. S. Willis. The doctor urged the need of closer cooperation between the members of the Association.

The State Veterinarian, Dr. J. G. Ferneyhough, read an address on "Why the State Veterinary Department Does not Recognize the Retest of Reactors." This brought out a good deal of discussion, which resulted in the passage of a resolution to the effect that the Association fully endorsed the sentiments expressed in the address.

Dr. W. L. Thompson, of Suffolk, Va., read a paper on "Botulism in Horses." This was followed by a very spirited discussion, particularly regarding the use of serum in treatment and prevention.

The election of officers for the next year resulted as follows: Dr. E. J. Willis, Harrisonburg, Va., President; Dr. R. M. Graves, Culpepper, Va., First Vice-President; Dr. W. A. Robins, Danville, Va., Second Vice-President; Dr. Geo. C. Faville, Hampton, Va., Secretary-Treasurer.

The next meeting will be held at Ocean View, Va., July 12-13, 1923. An interesting program is being arranged and a good meeting is assured.

Geo. C. Faville, *Secretary.*

VETERINARY MEDICAL ASSOCIATION OF NEW YORK CITY

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 West 43rd St., Wednesday evening, March 7th, at 8:45 p.m.

The minutes of the February meeting were read and approved.

Dr. J. G. Wills, of Albany, N. Y., gave a very interesting talk on the control and prevention of rabies, as conducted by the State Department. He stated that this disease was not very prevalent in the northern one-third of the State, and that this was due to the distance from large cities and to the less populated

areas, but he was of the opinion that in the future, owing to the advent of the automobile, it may become more prevalent in that end of the State.

He explained the losses among sheep, due to stray dogs. A number of cattle have died, due to having been bitten by rabid dogs. Vaccination of all animals in outbreaks has not yet been considered definitely, but might be of value during a quarantine. The difficulty in maintaining quarantine regulations and muzzle ordinances in the various communities was due to the inability to secure competent men to do the work. The muzzling and licensing laws were due to the sheep industry, and rabies outbreaks were usually due to stray dogs. It was the speaker's belief that by immunizing all dogs, an immune race might be developed.

Dr. Wills spoke of his work at the present time of supervising the animal industry of the various state institutions, numbering 42, divided into the charitable, prisons and reformatories, with a combined population of inmates and help of about 100,000 persons. These institutions conduct 30 farms, of from a few acres to one of 13,000, at Clinton prison. On these farms are conducted 26 dairies, of from 5 to 250 cows. A total of about 3,000 cattle, 5000 to 10,000 hogs, 30,000 poultry and between 400 and 500 horses are maintained on these farms.

Of the 26 dairy herds, six are placed on the accredited list and nine have passed two tests. The per-cow production of some of the herds was one-third higher than the average, due to constantly adding fresh cows. The hogs on these farms are practically free from hog cholera. The farm products from these farms consist principally of hay and garden products.

Dr. Geo. J. Goubeaud reported some cases of dogs being bitten by a rabid animal, and among these were eight dogs vaccinated one year ago, all being well at this time. Dr. W. C. Miller stated that the Department of Health was in sympathy with some feasible plan for vaccinating all dogs, but spoke of the difficulty of controlling the dogs belonging to irresponsible people. Dr. J. Payne Lowe spoke of an outbreak of rabies around Nutley, N. J., and had vaccinated a number of dogs exposed. The rabies question was further discussed by Drs. Miller, Little, Chase and others.

Dr. Ray W. Gannett gave a good report of the Conference of Veterinarians held at Ithaca, Jan. 11th and 12th. Dr. C. S. Chase also discussed the various papers presented at Ithaca.

Drs. W. C. Miller and Henry Amling were elected to membership in the Association.

No further business appearing, the meeting adjourned.

April Meeting, 1923

The regular monthly meeting of the Veterinary Medical Association of New York City was called to order by the President, Dr. J. Elliott Crawford, in the Academy of Medicine, 17 West 43rd St., New York City, April 4th, at 8:45 p.m.

The minutes of the March meeting were read and approved.

Dr. Chas. V. Noback related some of his experiences while in Colombia, South America. Owing to the high altitudes and the lowlands, a number of peculiar or strange symptoms appear among the animals. He found the lowlands, owing to the moisture, fertile soil and continued moderate temperature, to be fertile fields for the growth of bacteria and epidemics of various diseases would soon reappear, after they were thought to be under control.

He found but few veterinarians in the country and most of the work is being done by trained laymen. A number of vaccines and serums are used, but it will require a large force of trained veterinarians and bacteriologists to organize the veterinary control work properly in that country.

Dr. Adolph Eichhorn addressed the meeting on the "Activities of the Veterinarian n Comparative Medicine." The doctor advised and encouraged a liberal campaign of advertising, as the need of the veterinary profession, and that we must impress the medical profession of our importance in the protection of human life. He spoke of a number of contagious diseases at length, and brought out many important points in their control, all of which will be published in the Journal of the A. V. M. A.

Dr. Slawson reported having seen a case of actinomycosis in a girl, in New Jersey. Dr. E. B. Ackerman reported having seen 16 cases of glanders in the human, while in the Department of Health.

Dr. C. S. Chase spoke of the inefficient inspection of food and milk products in the rural districts and that such inspection should be controlled entirely by the veterinarian.

Dr. Alex Slawson suggested that we report, in the local papers, the various papers read in this Association.

On motion a rising vote of thanks was extended Drs. Noback and Eichhorn for their splendid addresses.

No further business appearing, the meeting adjourned.

C. G. Rohrer, *Secretary.*

B. A. I. VETERINARY INSPECTORS' ASSOCIATION OF CHICAGO

The following is a report of the meetings held during the past month by the school of instructions for veterinary inspectors which meet in the Government Office of one of the local plants each Monday morning. The Chicago Branch of the National Association of Bureau of Animal Industry Veterinarians prepares a program for several weeks in advance on various subjects relating to meat inspection. Pathological specimens of interest, as well as rare conditions found by the inspectors are collected during the week and presented to the meetings for diagnosis and discussion.

On April 16, 1923, Dr. A. A. Swaim gave a very interesting and instructive talk on "Diseases, Diagnosis and Dispositions, in Accordance with B. A. I. Regulations."

On April 23rd and 30th, talks were given by Dr. L. T. Hopkins, who discussed "The Lymphatic System and Its Importance to Post-mortem Inspection." All of the important lymphatic glands were illustrated on large charts, showing the afferent and efferent vessels.

L. T. HOPKINS, *Secretary.*

VETERINARY MEDICAL ASSOCIATION, FIRST DISTRICT OF OHIO

The Veterinary Medical Association of the first district of Ohio held its spring meeting, at London, Ohio, on Thursday, April 19th. The meeting was well attended by the men of Union, Madison, Clark, Logan and Champaign Counties, which counties constitute the district. The Association has been in existence nine months and has held three meetings.

Drs. Dingman and Hunt, of London, arranged for a mighty fine luncheon at the Neil House, which was very much enjoyed by all the boys present. The meeting proper was held in the Directors Room of the Exchange Bank. The program consisted of the following papers; "Swine Parasitism," by Dr. Stockwell, of Mechanicsburg; "Surgery in Swine," by Dr. Kettler, of Milford Center; "Post-vaccination Problems," by Dr. Shaw, of St. Paris; and "The Necessity of a Veterinary Practice Act," by Dr. F. A. Lambert. The papers were fine and were thoroughly discussed.

Dr. Fred A. Zimmer, newly appointed State Veterinarian, was present and outlined the policies of the State Veterinarian's

office. He solicited the cooperation of practicing veterinarians. Dr. Zimmer's talk was very much appreciated by the Association and the policies outlined were heartily endorsed.

All in all this meeting was the best the members have attended for some time. The Association adjourned to meet at Russels Point, Ohio, in August, with the Northwestern Ohio Veterinary Medical Association.

P. T. ENGARD, *President.*

NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS, METROPOLITAN DIVISION

A meeting of the Metropolitan Division, N. A. B. A. I. V., was held at the Laboratory, U. S. Barge Office, New York, N. Y., at 8 o'clock, p. m., May 4, 1923. Thirty-four members were present, Dr. Albert Long, President, presided.

Through the courtesy of the Chief, Bureau of Animal Industry, Dr. U. G. Houck, Chief, Division of Hog Cholera Control, was present and delivered an address in which he outlined the history and various activities of the Bureau. He made particular reference to the valuable farm experimental and demonstration work carried on by the Bureau in the various states, either alone or in cooperation with the State Experimental Stations. A vote of thanks was extended to Dr. Houck for his instructive and interesting address. Also, the Secretary was instructed to write to the Chief of the Bureau, thanking him for his courtesy.

Previous to the address by Dr. Houck, a business session was held.

Dr. R. M. Mullings, Chairman of the Legislative and Publicity Committee, reported by letter a recommendation of the Committee that the Division have an open meeting to which the public and representatives of the press be invited, this meeting to be addressed by some person designated by the Bureau who will give the public an outline of the Bureau's activities, followed by several reels of motion pictures portraying the actual work of the Bureau.

A letter was received from Dr. E. H. Baumann, Albany, N. Y., resigning from our Division on account of his joining a new Division organized in his District, known as the "Northeastern States Division." Resignation accepted.

A motion was made and carried that the Division be represented by a delegate at the next National Convention.

Election of officers:—Dr. J. Huelsen, president; Dr. C. R. Biederman, vice-president; Dr. E. L. Sander, secretary-treasurer.

E. L. SANDER, *Secretary-Treasurer.*

NATIONAL ASSOCIATION OF B. A. I. VETERINARIANS, MICHIGAN DIVISION

The annual meeting of the Michigan Division of the National Association of Bureau of Animal Industry Veterinarians was held in Room 408, Post Office Building, Detroit, Mich., Friday evening, May 4, 1923. Following the election of officers and routine business, the members repaired to the Fort Shelby Hotel and enjoyed an evening at the banquet table, where, in addition to good things to eat, a musical and intellectual treat was given.

The musical program was furnished by Dr. Chas. F. Davis, of the Detroit force, and Mesdames Dunn and Collings, the latter being a daughter of our local President Dr. E. P. Schaffter.

Following this program, the toastmaster, Dr. Schaffter, introduced the following speakers: Dr. H. Preston Hoskins, Secretary-Editor of the A. V. M. A. who spoke on "The Value of Organization." Dr. Hoskins scored many lasting impressions with his subject. Dr. B. J. Killham, State Veterinarian, told us of the work of the State Agricultural Department and the methods used in handling various animal diseases in Michigan, inimical state laws and bills proposed, which could be coped with successfully only through organization.

Dr. S. Brenton, ex-President of the A. V. M. A., gave an instructive, helpful and much appreciated talk on the veterinary profession. Dr. R. A. Runnells, Assistant Pathologist, Veterinary Department, Michigan Agricultural College, and Secretary of the State Association, gave an address that was interesting and instructive.

Dr. Henry V. Smith, of the Detroit B. A. I. force, talked on "Imports and Exports in Connection with the Bureau of Animal Industry, at the Detroit Station." Dr. Smith, whose duties cover meat export and import, and animal export and import, displayed a high degree of familiarity with this work and handled his subject in a forceful manner.

The members of the Committee on Arrangements are to be congratulated for their splendid work and program. Dr. M. A. Ruck, of Detroit, was elected local President for the ensuing year and J. W. Vance, Secretary-Treasurer.

J. W. VANCE, *Secretary-Treasurer.*

THE CONESTOGA VETERINARY CLUB

The Conestoga Veterinary Club held its annual Shad Dinner at the Stock Yards Inn, Lancaster, Pa., on May 10th, with twenty-nine members in attendance. Drs. C. J. Marshall, W. J. Lentz, G. A. Dick, F. A. Marshall, T. E. Munce, H. R. Church and S. E. Bruner attended, as guests of the Club. There was much enthusiasm displayed and the occasion was enjoyed by all.

NATIONAL CONVENTION OF ALPHA PSI FRATERNITY

The sixth National Convention of the Alpha Psi Fraternity convened at the Alpha Chapter House, Columbus, Ohio, May 18, 1923. Vice President John I. Handley, of Atlanta, Ga., presided. The following delegates were in attendance: F. G. Loomis, Alpha (Ohio State University); C. N. Bramer, Beta, (Cornell University); J. H. Spence, Epsilon (University of Pennsylvania); Scott A. Burnam, Zeta (Colorado Agricultural College); H. W. Graves, Theta (Alabama Polytechnic Institute). Iota and Kappa Chapters were unable to send delegates.

Besides the usual routine business transacted, one of the important decisions arrived at was to resume publication of the Alpha Psi Quarterly, and to publish the proceedings of this convention in the first issue, which will make its appearance about September 1st. It was decided to hold the next convention in 1925, as the guests of Zeta Chapter, either at Fort Collins or Estes Park, Colo.

National officers were elected as follows:

President: Dr. John I. Handley (Theta), of Atlanta, Ga., for four years.

First Vice-Pres.: Dr. R. E. Rebrassier (Alpha), of Columbus, Ohio, for two years.

Second Vice-Pres.: Dr. B. Scott Fritz (Epsilon), of Philadelphia, Pa., for two years.

Secretary: Dr. H. Preston Hoskins (Epsilon), of Detroit, Mich., for four years.

Treasurer: Dr. M. C. Linnemann (Gamma), of St. Joseph, Minn., for two years.

The entire first day of the convention was consumed with business sessions, which did not come to a close until 8:00 P. M. The second day was given over to a very fine social program which had been arranged by the members of Alpha Chapter.

COMMUNICATION

HOG CHOLERA LEGISLATION IN MICHIGAN

To the Editor:—

Michigan veterinarians and several of the leading swine breeders, assisted by some of the most prominent county agricultural agents, succeeded in defeating a bill to amend the livestock sanitary laws of the State, so that after meeting certain requirements the laity could immunize hogs against cholera. The bill was patterned after the Iowa law and called for the conducting of schools to instruct farmers to vaccinate their own hogs. The bill also was intended to regulate the sale and use of biologics by veterinarians. As originally introduced, the bill made it unlawful for a veterinarian to make a profit on serum, but this was finally amended to permit him to make a profit of 15 percent. The penalty for violation of this section of the act was to be revocation of the veterinarian's license for a period of one year.

The bill was introduced in the House of Representatives and referred to the House Agricultural Committee. The Michigan State Veterinary Medical Association, the State Department of Agriculture, the American Veterinary Medical Association and the Veterinary Division of the Agricultural College had representatives at a hearing before this committee. In addition to these bodies, five leading and aggressive county agricultural agents and a few swine-breeders were present to oppose the bill. The proponents of the bill were represented by six or eight hog-raisers of Lenawee County, together with their county agricultural agent, who sponsored the bill.

The House Agricultural Committee reported the bill out favorably, with an amendment permitting veterinarians to make a profit of 15% on serum. When it came up on general orders, further amendments were tacked on, and when it came up for final reading still another was added, which limited the conducting of schools to counties in which at least five reported and verified outbreaks of cholera had occurred within a period of six months prior to the conducting of such a school. After considerable debate the bill lost by a vote of 47 to 39.

The opposition in the House was led by Rep. J. P. Espie, of Eagle, Michigan, and it is hoped by officers of the State Association that many of the veterinarians of Michigan will write Mr. Espie a letter, letting him know that his efforts in opposing this pernicious piece of legislation are highly appreciated.

R. A. Runnells, *Secretary.*

East Lansing, Mich., May 14, 1923. Mich. State Vet. Med. Ass'n.

MISCELLANEOUS

VETERINARY WORK IN INDIA

Last year an advisory committee appointed to report on research in diseases of animals in India stated that there were immense opportunities, which were almost wholly neglected. A conference of veterinary authorities convened by the government, which met last February at Calcutta, confirmed the preceding statement and urged the training in courses of two or three years of native veterinarians of a second grade cadre, who might at least be competent to carry out instructions and perform routine work. The present financial stringency prevents the materializing of a recommendation of previous conferences to provide facilities for the training of natives up to the highest standards. Experience with the training of Indians in other branches of applied science, such as medicine, shows their capacity to grasp fully the results of modern science. But for this, an ample preliminary education and a full course of four years' professional work at a properly equipped college would be necessary.

The conference reviewed the state of knowledge and practice with regard to the chief animal diseases now ravaging India, and arrived at lamentable conclusions. Anthrax infection is so heavy in East Indian wool, hair and hides that the labor organization of the League of Nations drew attention to it. The cost of disinfecting wool is greater than its present value. The conference decided that the agencies for the notification of anthrax must be improved, and that much research and skilled inspection are required to attack the cause at its seat. Rinderpest still exacts a heavy toll from live stock in India, and although an efficient serum is produced in large quantities in the Muktesar Imperial Bacteriological Laboratory, the veterinary service is insufficient to distribute and administer this preventive measure. Surra disease of horses and camels is sometimes so disastrous as to interfere with military operations. It is known to be caused by a trypanosome and probably, like trypanosomiasis and nagana, is insect-borne. But entomologic and veterinary research is necessary to discover the bearer and, therefore, the means of dealing with the disease.

Though tuberculosis is supposed to be a rare disease of cattle in India, it is an increasing cause of death in industrial centers, and a large proportion of cases show symptoms which in Europe are associated with the bovine type. But there is at present neither knowledge as to the prevalence of the human and bovine type of bacillus, nor any organization for getting it. Contagious abortion of mares and cattle, and the large number of infections due to hookworm, rabies and other diseases await research on a much larger scale. The conclusion is that veterinary education, research, legislation and administration in India are unsatisfactory, and require the serious attention of the government.

(*Jour. A. M. A.*)

CONSIDER THE RABBIT'S FOOT

A. J. C. in HYGEIA

Among the illiterate, in certain parts of the country, there is a firm belief in the value of the rabbit's foot as a preventive or cure of disease and as a bringer of good luck. It must be the left hind foot of a rabbit that has been caught in a churchyard during the dark of the moon. Probably the number of people in the United States who believe in the efficacy of a rabbit's foot is small. But suppose that some one concern had an exclusive proprietary right to the sale of rabbits' feet and that the feet could be purchased only from this company; suppose, further, that the company carried on an extensive and intensive advertising campaign setting forth the marvelous therapeutic efficiency of the pedal extremities of *Lepus sylvaticus;* suppose that articles appeared here and there in the newspapers telling of the success that had attended the use of the rabbit's foot in the treatment of certain ailments; suppose that signed testimonials were published recording the alleged recoveries from various chronic ailments following the use of this marvelous curative agent. What then! It is by no means unthinkable that under such conditions many people of intelligence would be found ready to declare that the rabbit's foot has curative powers and that the physician who pooh-poohs the idea is actuated only by professional jealousy. Fortunately, there can be no monopoly on rabbits' feet. Any one can sell them. Therefore it does not pay to spend money on an advertising campaign extolling their curative value. And this, possibly, is the only reason that has prevented the humble cottontail from becoming a therapeutic hero.

VETERINARIANS ON PROGRAM OF WORLD'S DAIRY CONGRESS

Two University of Minnesota veterinarians have been honored by places on the program of the World's Dairy Congress. Their papers will be presented before a symposium on Important Diseases of Dairy Cattle. Dr. C. P. Fitch will read a paper on "The Present Status of our Knowledge of Abortion Disease," and "Sterility" will be presented by Dr. W. L. Boyd. The papers are to be printed in four languages. Delegates from every country in the world have been invited and are expected to attend this congress. Sessions will be held in Washington, D. C., and then the congress will adjourn to Syracuse, N. Y., in connection with the National Dairy Show.

ANOTHER COURT DECISION

The Supreme Court of Washington has upheld a lower court in rejecting the testimony of a physician in a case involving a charge of misrepresentation, with regard to certain cattle which had been subjected to the tuberculin test, a few days before their sale. The physician was not allowed to testify because he was not a veterinary surgeon, and, therefore, not qualified in veterinary science, and because he had never treated cattle or animals, and knew nothing about the effects of tuberculin on cattle or other animals. The Court held that while a general physician may have some knowledge as to the effect of tuberculin tests on either human beings or other animals, the witness in this case could not be said to have so qualified himself as to diseases of cattle and testing them for tuberculosis.

Some Corn Crop

The teacher asked if there was anything worse than a giraffe with a sore throat?

"Yes, sir," came the answer from one boy.

"What, pray?" asked the teacher in surprise.

"A centipede with corns."—*Boot and Shoe World.*

An Easy Keeper

"What creature is satisfied with the least food?" asked the teacher.

"The moth," shouted the eager boy: "he doesn't eat anything but holes."—*Bulletin of Pharmacy.*

NECROLOGY

HENRY CAIRNCROSS LYON

Dr. H. C. Lyon, of Hutchinson, Minnesota, passed away Monday evening, April 30, 1923, at his home, after a brief illness. Dr. Lyon was born June 4, 1856 in the Province of Ontario, Canada, the son of Scotch parents. He came to the United States at the age of 24, settling at Grandin, North Dakota. He was married April 4, 1887 to Rebecca Pratt, of that city. He graduated from the Ontario Veterinary College, with the class of 1891. He immediately located in Hutchinson, Minnesota, and established a practice there. He remained in active practice until about fifteen years ago, when he accepted a position as Field Veterinarian, with the Minnesota State Live Stock Sanitary Board. About two weeks before his death, he was promoted by being elected Assistant Secretary of the Board. His work as a veterinary control officer took him into every corner of the state, and there was hardly a Minnesota veterinarian to whom Dr. Lyon had not endeared himself, so much so that he was called "Dad" by practically all of his colleagues in the profession.

Dr. Lyon joined the American Veterinary Medical Association in 1902. He was a member of the Minnesota State Veterinary Medical Association and served this body as President about two years ago. Dr. Lyon was a member of Temple Lodge No. 59, A. F. & A. M., with which he affiliated soon after locating in Minnesota; a member of St. Paul Consistory, 32nd degree Masons; and of Osman Temple, St. Paul, Nobles of the Mystic Shrine. He was also a member of the Order of the Eastern Star, and is said to have been the oldest member of that order, in point of years, in Hutchinson. Dr. Lyon is survived by his widow and one son, William, who is located in Los Angeles, California. For many years Dr. Lyon was in charge of the live stock sanitary work in connection with the Minnesota State Fair, and in this capacity he had come in contact with practically every prominent breeder in the Northwest. About fifty veterinarians were in attendance at the funeral.

We extend our sympathy to Dr. and Mrs. P. W. Horner, of Elkhart, Ind., in the loss of their only child, Dorothy Mary, aged 7 years, on April 3, 1923, from diphtheria.

Mrs. Harry J. Hoffeins, of Alta, Iowa, died March 19, 1923. She was born in Iowa Township, Crawford County, January 15, 1891, and was joined in marriage to Dr. Hoffeins June 10, 1914. Besides her husband she leaves two children, Adeline Rose and Harry Rae, her parents and one brother to mourn her loss. Mrs. Hoffeins was very active in church work in her community.

MARRIAGES

Dr. Ivan B. Boughton (Ohio '16), of Urbana, Ill., and Miss Juliette Bouin, of Bordeaux, France.

Dr. Denton H. Eastman (Ohio '22), of Galesburg, Ill., and Miss Tressa Sloan, of Greenville, Pa.

Dr. J. B. Hinds (K. S. A. C. '18), of Big Timber, Mont., and Miss Mary Agnes Holbrook, of Billings, Mont.

Dr. Isaac Gatz (K. S. A. C. '21), of Inman, Kan., and Miss Dorothy Ellis, of Pratt, Kan., December 28, 1922.

Dr. Raymond E. Harvey of Bonesteel, S. Dak., and Miss Verena Marguerite Boneberger, of Butte, Nebr.

Lt. J. W. Worthington (K. S. A. C. '17), of El Reno, Okla., and Miss Bernice Iva Loomis, December 17, 1922.

Dr. Edward J. Jelden (K. S. A. C. '22), of Whitewater, Kan., and Miss Vera Gates, of Pawnee, Okla., December 24, 1922.

Dr. Frank Charles Gearhart (Iowa '07), of Manila, P. I., and Mrs. Grace Thurber McKibbin, of Philadelphia, Pa., March 5, 1923.

Dr. John Sturrock (Corn. '20), of Attica, N. Y., and Miss Mary Medlock, of Interlaken, N. Y., May 22, 1922. (Announced April 23, 1923).

BIRTHS

Dr. and Mrs. E. A. Gilmore, of Effingham, Kan., a son, January 29, 1923.

Dr. and Mrs. White, of Riverside, Iowa, a daughter, Lourine Betty, April 4, 1923.

Dr. and Mrs. Clifford Gallagher, of Manhattan, Kan., a son, February 2, 1923.

Dr. and Mrs. H. L. Coffin, of Adair, Iowa, a daughter, Janelda Ann, April 5, 1923.

Dr. and Mrs. L. P. Johnson, of Oakland, Nebr., a son, Loren Paul, January 11, 1923.

Dr. and Mrs. I. Kleveland, of Sioux Rapids, Iowa, a son, Rodney, December 19, 1922.

Dr. and Mrs. W. W. Williams, of Springfield, Mass., a daughter, Rosalind, April 17, 1923.

Dr. and Mrs. P. E. Simard, of Montreal, Que., a daughter, Mary Phoebe, January 4, 1923.

Dr. and Mrs. W. A. Jones, of Johnson City, Tenn., a son, William A. Jr., January 14, 1923.

Dr. and Mrs. H. D. O'Brien, of Danville, Ill., a daughter, Rebecca Joyce, December 18, 1922.

Dr. and Mrs. G. N. Russell, of Lawrence, Kan., a daughter, Elizabeth Leigh, January 7, 1923.

Dr. and Mrs. Homer C. Boyd, of Texhoma, Okla., a daughter, Delois Elaine, March 24, 1923.

Dr. and Mrs. Wilbur R. Kidwell, of Boise, Idaho, a daughter, Margaret Louise, January 3, 1923.

Dr. and Mrs. G. L. Schaefer, of Tekamah, Nebr., a daughter, Elizabeth Josephine, January 16, 1923.

PERSONAL

Dr. W. H. Lake is Mayor of the town of Morden, Manitoba.

Dr. Roy Rowe (Corn. '16), has removed from Little Falls, N. Y., to Millerton, N. Y.

Dr. B. J. Cady (Corn. '04), has left Olean, N. Y., and is now at Belmont, same state.

Dr. Herbert Howard (Chi. '18), has removed from Columbia City, Ind., to Leesburg, Va.

Dr. H. R. Schwarze (Chi. '07), is now with the Corn Belt Serum Company, of East St. Louis, Ill.

Dr. William Harward (U. S. '17), has been transferred from Lake City, Fla., to Oakboro, N. C.

Lt.-Col. Charles H. Jewell (Corn. '00), U. S. Army, retired, is now located at Junction City, Kans.

Dr. John W. Hermann (Cinn. '13), formerly of Owensboro, Ky., has been located at Windsor, N. C.

Dr. Horst Schreck (Ind. '16), is now in Kansas City, Mo. He gives his address as 4201 Locust St.

Dr. Charles W. Selemeyer (U. P. '21), has been appointed City Meat and Milk Inspector of York, Pa.

Drs. Chas. H. Greenfield (Chi. '12) and G. Floyd Ewalt (Ont. '14), of Detroit, Mich., have formed a partnership.

Dr. E. T. Hallman (Ala. P. I. '10) fills the classification of Veterinarian, in the Rotary Club, of Lansing, Mich.

Dr. J. B. Way (K. C. V. C. '14), is now located at Elkton, Ky. He was formerly at Hopkinsville, same state.

Dr. W. E. Dodd (K. C. V. C. '18) has been transferred from Little Rock, Ark., to Boise, Idaho, c/o Dr. W. A. Sullivan.

Dr. Joseph P. Gerety (U. P. '10), until recently in the Army service, is located at 1640 River Ave., San Antonio, Texas.

Dr. C. S. Elliott (Ont. '84) has requested that his address be changed from Arcanum, Ohio, to 204 Euclid Ave., Greenville, Ohio.

Dr. H. E. Johnston (Iowa '13), writes that he has been transferred from Fargo, N. D., to Algona, Iowa. His address is 6 Liberty St.

Dr. D. C. Beaver (Mich. A. C. '18) is a part-time assistant in pathology and is also registered as a student in the Detroit College of Medicine.

Dr. V. P. Norton (Gr. Rap. '05) of Wisconsin Rapids, Wis., is Wisconsin State President of the National Single Comb White Leghorn Club.

Dr. G. R. Beavers (McK. '10) of Strawberry Point, Iowa, is a breeder of Single Comb Rhode Island Reds and Single Comb Black Minorcas.

Dr. H. C. Rogers (Chi. '06), of Audubon, Iowa, says that a veterinarian would soon become fossilized if he did not read the JOURNAL regularly.

Dr. Edgar L. Olson (McK. '20), formerly at Fort Whipple, Prescott, Arizona, is now in Minneapolis, Minn. His address is 5209 37th Ave., So.

Dr. J. R. Morse (Corn. '13), who has been practicing at LeRoy, N. Y., has accepted a part interest in the practice of Dr. J. F. DeVine, of Goshen, N. Y.

Dr. H. L. Van Volkenberg (Corn. '18), formerly at the U. S. Experimental Fur Farm, Keeseville, N. Y., has been transferred to St. Paul Island, Alaska.

Dr. M. M. Davis (McK. '15), formerly of Mt. Hope, Wis., has accepted an appointment with the Bureau of Animal Industry, and is now stationed in Chicago.

Dr. Henry E. Kreidler (U. P. '20), of Red Lion, Pa., has accepted a position as Claim Agent with the Association of Railroads, and is located at Jersey City, N. J.

Dr. F. E. McClellan (Corn. '09), of Buffalo, N. Y., was the speaker at the Forum of the Veterinary College, at Cornell University, May 4th. He gave an interesting and instructive talk on his experience in the practice of veterinary medicine.

Dr. Frank H. Miller (McGill '87) was in Ithaca, N. Y., April 27-28, attending a meeting of the Board of Trustees of Cornell University, of which Board he is a member.

Dr. O. E. Gladfelter (U. P. '17), formerly of Seven Valleys, Pa., has located at York, Pa., where he will open a small animal hospital and make a specialty of canine practice.

Dr. Archibald R. Ward (Corn. '01) is now located in Detroit, Mich., with the Frederick C. Matthews Company, an organization of technical advisers for dairy manufacturers.

Major Olaf Schwarzkopf (Berl. '80) U. S. Army, retired, is now travelling in Europe. He is receiving his mail in care of the American Consul, 24 Victoria Str., Coblenz, Germany.

Dr. Carl W. Gay (Corn. '99), of the Ohio State University, acted as judge of draft horses at the Philadelphia Indoor Show, which was held at the Squadron Armory, on May 2-5, 1923.

Dr. Edward Morgan, writing from Puerto Cabello, Venezuela, after having read the March JOURNAL, writes, "We have no doubt whatever about its valuable contents in the future."

Dr. B. M. Underhill (U. P. '95), addressed the regular meeting of the Schuylkill Valley Veterinary Association, on April 18th, on the subject of "Internal Parasites, Their Diagnosis and Treatment."

Dr. A. R. Mahan (San Fran. '17), after more than five years with the Bureau of Animal Industry and the U. S. Army, has decided to go into practice. Dr. Mahan has located at Marysville, Cal.

Dr. W. E. Coomer (Gr. Rap. '06) is chairman of a committee appointed to set a standard of prices for tuberculin testing and hog cholera immunization for the Michigan State Veterinary Medical Association.

Dr. Frank D. Porter (Ind. '16), formerly stationed at Evansville, Ind., on hog cholera control work, has been transferred to Fort Worth, Texas, on stock yard inspection and quarantine work, with the Bureau of Animal Industry.

Dr. Joseph Hawkins (Ont. '71) was among those injured in a train wreck which occurred recently near Salt Lake City. Dr. Hawkins was returning East from his winter's sojourn in California. His injuries were reported as not serious.

Dr. Ward Giltner (Corn. '06) was the leading speaker at the meeting of the Detroit Branch of the Society of American Bacteriologists, May 16, 1923. His topic was, "The Laboratory of Bacteriology at the Michigan Agricultural College; Its Work."

Dr. Maurice C. Hall (Geo. Wash. '16), our distinguished helminthologist, received quite a write-up in a recent issue of Henry Ford's *Dearborn Independent*, It is to be hoped that everybody who read the article was able to deduce that Dr. Hall is a veterinarian. This fact was not brought out very plainly, however.

Dr. S. Brenton (Ont. '80), of Detroit, Mich., after having had the same telephone number for over thirty-five years, was recently compelled to have it changed, incident to the installation of automatic telephone exchanges in the Motor City. The change was slight, however, from 969 to 0969, to give the number four digits.

Lawton, Mich., can boast of a veterinarian who is something of a financier, even in these times of depression. Dr. E. C. Goodrich (G.R. '15), is President of the First National Bank, Vice-President and General Manager of the Commonwealth Mortgage Company, and owns a large grape farm. On top of all this he is Mayor of the City.

Dr. H. W. Turner (U.P. '93) who is with the Pennsylvania Bureau of Animal Industry, and also Chairman of the A. V. M. A. Committee on Prevention and Control of Animal Diseases, has been doing some valuable educational work by addressing farmers' meetings on the subject of the prevention of transmissible diseases of farm animals.

Dr. Jacob Traum (N. Y. S. V. C. '05), who is on leave of absence from the University of California, engaged in post-graduate work at Cornell University, is endeavoring to have his leave extended beyond July 1st, so that he may be able to take part in the program of the New York State Veterinary Medical Society meeting, to be held at Ithaca, July 25th, 26th and 27th.

Dr. Jacques E. Aghion, (Ont. '07), of Sakha, Egypt, writes that he is back home after an absence of three and one-half months, spent in visiting the veterinary colleges of Europe. He spent some time in Austria, Germany, Belgium, France and Italy. Dr. Aghion has been elected, for the third year, as a member of the Committee to the Egyptian Veterinary Medical Society.

Dr. Russell A. Runnells (Mich. A. C. '16) accompanied the senior veterinary class of the Michigan Agricultural College, on their annual pilgrimage to Detroit early in May. The class visited a number of the large packing plants; the Detroit Creamery Company's horse barn, in Detroit, and certified dairy, at Mt. Clemens; Parke, Davis and Company's laboratories, in Detroit, and biological farm, at Rochester; the Detroit College of Medicine; and a number of veterinary hospitals in the Motor City. In the evening of May 2nd the students were the guests of Dr. S. Brenton, at a dinner, given at the Michigan Club.

A Wobblin' Dobbin

Cake Eater (at dance): "What is that step that couple is doing?"

Ditto: "That's the horse walk."

Cake Eater: "Why call it the horse walk?"

Ditto: "Wagon behind."—*'Ee-'Aw.*

Serious

Maid: "I couldn't come yesterday, Miss Jackson. I was suffering that badly with pain in my chest."

Mistress: "What was it, Melissa? Dyspepsia?"

Maid: "Yes'm, it was. But the doctor, he calls it an attack of acute indiscretion."—*Bulletin of Pharmacy.*

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